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ABSTRACT

OBJECTIVES: The development of undergraduate teacher education programs and the development of materials to be used in these programs. DURATION: Summer 1967 to the summer 1971. AUDIENCE: Education majors at Fairmont State College, Shepard College, West Virginia State College, and West Virginia University. CURRICULUM: Child development, measurement, educational research, and other areas including audio-visual education, radio and television, film production, and other related areas. TEACHING METHODS: A series of planned cooperative meetings maximizing the effective use of institutional resources and the production of materials. Also a series of field tests conducted on the campuses of the developing institution. Each institution field tested different units of the materials. MATERIALS: Books, film-strip tape programs, slide-tape programs, articles, films, video-tape, lectures, recording tapes, and labs. EVALUATION: A subjective evaluation concluded that this operational model will provide and sustain change with greater monetary efficiency and with a shorter subsidy period than was previously possible. MODIFICATIONS: None. (MJM)

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A SUMMATIVE ANALYSIS
OF A TITLE III
STRENGTHENING DEVELOPING INSTITUTIONS PROJECT

GRANT NUMBER 01-0-76341

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CHAPTER I

INTRODUCTION

In 1967, the Federal Government funded a cooperative Title III Project that involved the following institutions: Fairmont State College, Shepherd College, West Virginia State College, and West Virginia University. The general aims of the Project were the following:

1. the development of undergraduate teacher education programs; and
2. the development of materials to be used in these programs.

The following report is in relation to that project. The purpose of the report is to present an historical account of the project's four year life span and to present an analysis of the institutional development that resulted from the involvement with the Title III Project.

I. RATIONALE

Educators are coming to recognize that the problems created by the expansion of man's knowledge, increased college enrollments, and new developments in technology cannot be solved by merely adding more courses to an already outmoded curriculum. Teacher training institutions need a curriculum that is integrated and designed to meet specific institutional and educational goals.

This curriculum need was the imputes that brought several institutions of higher learning in the West Virginia Appalachian Region together in the Fall of 1966-67 to discuss a fundable cooperative project that would come to grips with this curriculum problem.

Preliminary discussions at these informal meetings led to the following general consensus: If the specific institutional and educational goals of the state colleges in the West Virginia Appalachian Region are to be realized, new materials and modes of instruction that are more efficient and effective will have to be developed and implemented in the teacher education programs at each respective institution.

A cooperative project was considered by the group to be the most efficient vehicle in the production of a broader range of approaches to teaching and learning than have been typical of teacher education programs in general and their teacher education programs in particular.

An application for support of this project under Title III of the Higher Education Act of 1965, Strengthening Developing Institutions, was submitted to the Federal Government for consideration. Support was granted under Title III, Grant Number 01-0-76341.

In the summer of 1967 the Dean of West Virginia University's College of Human Resources and Education, Dr. Stanley Ikenberry, made the following comments concerning the intent of the cooperative project:

> "These are exciting days in American education. There are so many new concepts today that we talk about or read about such as team teaching or micro-teaching or perhaps computer assisted instruction. And then, of course, there are the new curriculum in areas such as physics, chemistry, biology or mathematics. Other exciting uses are television and other electronic devices. And new terms such as modular-scheduling are gradually working their way into our vocabulary. Programmed instruction has been around for some time or new concepts such as mobile facilities are beginning to enter into the American educational scene. Such an exciting time to be a part of American education and it is a particularly exciting time and a challenge to be involved in the educating of teachers who will be entering into new professional roles facing new challenges in education in the years ahead. We are concerned that teacher education programs adapt to these revolutionary changes. We are concerned because we believe there is some truth, for example, to the old cliche that teachers teach in the ways in which they are taught. We are also concerned because we believe that if teachers are to use the new technology and if they are to adapt to the new instructional opportunities that may be theirs, they should have some direct personal learning experiences using these new media. And also, of course, we are

concerned that our own program of instruction be as effective as it can be and so if we believe there are advantages to be obtained through the use of new approaches to instruction such as computer-assisted instruction or the application of television or the use of micro-teaching in the training of teachers, that it is impossible for us on one hand to expound the virtues of these new approaches to teaching and learning to our students and then yet fail to use them ourselves. And so, it is within this context that Shepherd College, West Virginia University, West Virginia State College, and Fairmont State College have joined together in an inter-institutional cooperative project aimed at exploring the implications of the new technology in the changing American educational scene for the teacher training programs of our respective institutions. What do we propose to do? Well, one of our goals is to maximize the effective use of the institutional resources of each of our four institutions. We hope to build a more individualized and flexible system of learning for students enrolled in our respective programs. We hope to develop, on a cooperative basis, a pooled resource of the instructional materials obtained through the cooperative efforts of each institution, but yet shared by the teacher education programs of all four institutions. One of our aims is to involve as many faculty members as possible from each of these four institutions in the discussion and debate and development of these materials and instructional strategies so that in the very process of developing them we all become better acquainted with the potentials of these new media and once developed we are all able to apply them with a greater sophistication and effectiveness than would have otherwise been possible. We believe that through an approach such as this, the West Virginia University Faculty and the faculties of each of the cooperating institutions will be strengthened substantially as a result of their participation. Finally, I suppose the Project in which we are engaged is still another model of inter-institutional cooperation, exploring new ways in which those of us engaged in a common task, that of preparing teachers to work in West Virginia and to aid in improving the quality of education in the Appalachian Region. Those of us engaged in this common pursuit can work together to exchange ideas and hopefully can build and profit by each other's experiences."

II. PROJECT MEMBERSHIP

Fairmont State College

Fairmont State College, founded as a teacher training school, has in the last quarter century developed into a general purpose, coeducational, state-supported and controlled undergraduate college enrolling two thousand nine hundred and seventy two students, employing a full-time faculty of one hundred seventy four, and awarding the bachelor's degree in eighteen fields.

Fairmont State College draws ninty-two per cent of its student body from West Virginia, the heart of Appalachian, a region apart, distinctive in terms of its geography, its economy, its social customs, and its educational problems. Only twenty-three out of every one-hundred adults (twenty five years of age or older) in the region have a high school education or better. The figure for the rest of the country is fourty two for every one hundred adults. As a result of restricted educational opportunity, only five out of every one hundred adults are college graduates.

Since 1960 the college has more than doubled in size, and is fully accredited by the North Central Association of Colleges and Secondary Schools and the National Council for Accreditation of Teacher Education. It is a member of the American Council on Education, the Association of American Colleges, American Association of University Women, and the American Association of Colleges of Teacher Education.

Fairmont State offers a four-year curriculum in teacher education and liberal arts and sciences leading to degrees in Bachelor of Arts in Education, Bachelor of Arts and Bachelor of Science. Pre-professional curricula are offered in dentistry, law, medicine, pharmacy and social work. Terminal two-year curricula are offered in accountancy, clerical work, general education, nursing education, secretarial studies, and technical education.

Shepherd College

Shepherd College is a state-supported institution drawing enrollment largely from a sparsely populated and economically poor eight-county area of eastern West Virginia. Shepherd College shares its state support with eight other state colleges and two state universities.

The isolation of this eight-county region is at the same time a strength and a weakness so far as Shepherd College is concerned. It is a strength in that Shepherd College is the only four-year college in the region, and low tuition for West Virginia residents attracts the students of the region. The college also has weaknesses to overcome as a result of its location. There is little in the vicinity of the college to attract and hold qualified faculty. The state financial support of the college is not generous.

Shepherd College, located on the south bank of the Potomac River in Shepherdstown, West Virginia, opened its doors in September 1871 to one instructor and forty-two students. Since that time these numbers have grown to a student body of more than one thousand four-hundred and a faculty in excess of sixty. One thousand of these students are majors in the Education Curriculum.

Shepherd College is located near many of the nation's historical and cultural centers. Harpers Ferry, Antietum Battlefield, the colonial homes of the Washingtons. Washington, D. C., Baltimore, Philadelphia and New York City are also within reasonable driving distance.

Today Shepherd College offers the following degrees: Bachelor of Arts in Elementary Education, Bachelor of Arts in Secondary Education, and Bachelor of Science. Instruction is provided in art, biology, business administration, data processing, business education, chemistry, dramatics, driver education, economics, education, history, home economics, journalism, library science, mathematics, modern languages, music, philosophy, physics, political science, psychology, radio, sociology, and speech.

Shepherd College is accredited by the North Central Association of Colleges and Secondary Schools and by the National Council for the Accreditation of Teacher Education.

West Virginia State College

West Virginia State College, founded in 1891, is located at Institute, West Virginia, eight miles west of Charleston. Its campus is set in the foothills of the Appalachians, along the Kanawha River in the midst of the chemical research and manufacturing industries.

Until 1954, a land grant college for Negroes, it has since experienced a unique "integration in reverse" and has relinquished its land grant status. Since 1954, its enrollment has more than quadrupled. Its evening enrollment has gone from zero to one thousand three hundred and its racial composition has become approximately seventy five per cent white.

The college is also in an Appalachian setting and has been seriously handicapped in development by the low level of financial support given it and other state colleges by West Virginia. Since it draws students primarily from schools in Appalachian and secondarily from predominately Negro schools, its students frequently are culturally deprived, poorly trained and insufficiently motivated.

College curricula lead to the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Science in Education, Bachelor of Science in Business Administration, Bachelor of Science in Home Economics, Bachelor of Science in Industrial Technology, and Bachelor of Science in Law Enforcement.

Candidates for the Bachelor of Science may prepare to teach on the elementary, junior high and high school levels. The college prepares students to teach the following subjects: Art, Biology, Business, Chemistry, English, French, General Science, Health Education, Home Economics, Industrial Technology, Mathematics, Music, Physical Education, Physics, Safety Education, Secretarial Studies, Social Studies, Spanish, and Speech.

West Virginia State College has been accredited by the North Central Association of Colleges and Secondary Schools since 1927. The college is accredited for the preparation of elementary and secondary teachers at the bachelor degree level by the National Council for the Accreditation of

Teacher Education.

The enrollment of West Virginia State is approximately two-thousand four-hundred full time students. Of this total, two-thousand students are majors in the education curriculum.

West Virginia University

West Virginia University is a land grant institution established in 1867. From one college called the Agricultural College of West Virginia, the University has grown into a complex of six colleges, eight schools, and two divisions.

Located at Morgantown, the campus of West Virginia University covers some six-hundred acres, including seventy-five acres of the downtown campus, two-hundred and seventy-five acres of the Evandale campus and two-hundred and sixty acres at the Medical Center. The University also has more than eleven-thousand acres of experimental farms and forests and educational camps located throughout the state. The total enrollment of the University is approximately twelve-thousand. Of this total, about one-thousand three-hundred students are majors in the undergraduate education curriculum.

CHAPTER II

AN HISTORICAL OVERVIEW

I. PROJECT MODIFICATIONS

During the course of the four year project proposals and budgets were submitted to Washington annually for consideration and funding. A Federal cutback in monies allocated to this project resulted in modifications of both general and specific objectives during the last three years of developmental activity.

Developing institutional personnel entered the project with preconceived expectations of projected outcomes. Modifications on all project objectives were necessitated because of inadequate federal funding.

If only the revised plan of objectives and an historical account of the four year project were presented, the reader would notice several weaknesses in both the objectives and activities of this cooperative endeavor. Therefore, the original plans will first be presented and then an historical account of the revised activities of the project so that the reader will have an understanding of and an insight into the directional changes that ocurred during the project's tenure.

General Objectives and Projected Outcomes of the Original Plan

1. To explore the new educational technology available for teacher training programs;
2. To apply appropriate instructional technology in the design, development, field testing, evaluation, and implementation of newer modes of instruction in teacher education;
3. To apply appropriate instructional technology in the design, development, field testing, evaluation, and implementation of new educational materials in teacher preparation;

4. Individualized and more flexible instructional programs in teacher education;

5. Acquire and share a pooled resource of instructional materials obtained from each institution, through a national search and as a result of cooperative development efforts;

6. Involve college faculties and future elementary and secondary school teachers in newer methods, techniques, materials and curricular arrangements;

7. To directly strengthen the instructional program of developing institutions; and

8. Serve as a pilot test of a mode of inter-institutional cooperation.

The Original Plan

The initial plan covers a four year period. The mission will be plan, develop, field test, evaluate and implement newer modes of instruction, some of which may be technologically oriented and others which may suggest a more effective application of instructional approaches long known to professors and students.

Content areas to be the focus of the project were the following:

(a) an understanding and ability to apply the principles of educational psychology to include aspects of human development, especially as influenced by environmental factors and the human learning process as these skills may be relevant to understanding and teaching school age youngsters;

(b) techniques and understanding of educational measurement and evaluation as may be related to evaluating pupil performance and instructional effectiveness and critical consumer of educational research essential for long term professional growth,

(c) an effective use of instructional technology including knowledge of and skill in using the full range of available materials, multi-sensory techniques, technologies and approaches as should be available to the elementary and secondary school teacher.

Shown by phases, the original plan before modification was as follows:

PHASE I.

Time Period: June 12, 1967, through August 12, 1967.

Place: Campus of West Virginia University.

Mission: Develop operational goals to be achieved in the above content areas, i.e., what behavioral qualities, skills, ability, knowledge, etc., do we expect students to possess as a result of the instructional experience in question?

Initiate a comprehensive inventory of relevant resources, both human and technological relevant to the immediate and long range mission of the project and examine existing examples of relevant instructional aids, materials and technology already available which, with some adaptation, might be applied in this context.

Specify alternate instructional approaches hypothesized as effective in achieving the specified goals.

Engage in a pilot development effort in three or four areas, such as a programmed instruction sequence, a concept film, a television tape, or a series of case studies.

Staff: Each of the three developing institutions will send three faculty members to be joined by six faculty members from the cooperating University. The total team will include subject areas specialists in fields such as child development, educational psychology, measurement, educational research, and appropriate supporting personnel from areas such as art, audio-visual education, radio and television, film production, and other relevant areas. A personnel inventory is attached. The total project team will be formed on the basis of the ability of the developing and/or cooperating institution to contribute the particular skilled personnel in question.

PHASE II.

Time Period: September 1, 1967, through May 31, 1968.

Place: Campus of the developing institutions and the campus of the cooperating University.

Mission: 1. Initiate faculty discussions at the developing institution regarding the operational goals to be achieved as developed by the total team during the prior summer session.

2. Complete development and initiate field test of pilot efforts begun during the prior summer session.

3. Place a second series of pilot projects in the development state.

4. Conduct a comprehensive review of the master plan of work including goals, range of relevant resources and alternative approaches on the basis of (1) demonstrated effectiveness to that date, (2) feedback of faculty,

student and administrative acceptance of proposed master plan.

Staff: Personnel from each of the developing institutions will remain on the project staff approximately one-third time working on the project responsibilities at the respective developing institutions. Senior faculty members from the cooperating university will also continue to work on the project one-third time during the academic year 1967-68 while junior staff members from the cooperating university will devote one-half time to the project for the corresponding period. Effective communication and coordination among project members will be maintained by regular visits of the cooperating staff members to developing institutions, by return visits of developing institution staff members to the University campus, and through a series of three, three day conferences of project staff members and other interested parties from the respective institutions.

PHASE III.

Time Period: June 11, 1968, through August 11, 1968.

Place: Campus of West Virginia University or other suitable location as determined by the project staff.

Mission:

1. Continue developmental efforts with the objective of bringing a significant number of instructional "products" to an initial operational conclusion.

2. Design effective evaluation procedures to evaluate the effectiveness of instructional innovations as developed.

3. Concentrate on problems of content, integration, sequence, and feasible means for effective implementation.

4. Identify (a) earlier efforts in need of modification or larger scale revision, (b) new areas in need of additional investment because of considerations of sequence, or integration of subject matter, or unusual success experienced with a particular approach.

Staff: Similar to phase one, adjusted in specialty to meet the development demands as these may change over time.

PHASE IV.

Time Period: September 1, 1968, through May 31, 1969.

Place: Campus of the respective developing institutions and the campus of West Virginia University.

Mission: 1. Field test and evaluate the effectiveness of previously developed instructional materials, products or innovations including inter-institutional field tests for cross validation purposes.

2. Conduct institutional survey to establish equipment or other requirements essential for effective implementation of developed innovations.

3. Continue development efforts as specified in part four of Phase III.

4. Conduct appropriate communication and coordination activities essential to a productive decentralized effort.

Staff: Similar to Phase II.

PHASE V.

Time Period: June 10, 1969, through August 10, 1969.

Place: Campus of West Virginia University or other location as specified by the project staff.

Mission: 1. Arrange for appropriate reproduction of effective materials, devices, or other innovative project products.

2. Complete assessment of survey to establish capability for implementation of successful innovations; capability for implementation must be established no later than September 1, 1969.

3. Experimental implementation and evaluation of total instructional sequences with on-site modifications as indicated.

4. Develop capability for large scale field test in the Fall.

Staff: Similar to Phase I and III.

PHASE VI.

Time Period: September 1, 1969, through May 31, 1970.

Place: Campus of respective developing institutions and campus of cooperating University.

Mission: 1. Large scale implementation of instructional innovations as developed over the prior two and one-half year period with controlled evaluation and cross validation of results available among institutions.

PHASE VII.

Time Period: June through August 1970.

Place: Campus of West Virginia University.

Mission: Each of the three Developing Institutions will send four faculty members to be joined by four faculty members from the cooperating University. Participants will be organized into four teams. Each team will have one member from each institution.

Team I. Production and Field Testing Team. The major undertaking of this team through the summer will be to:

1. Survey all materials that have been produced and field tested.

2. Plan for evaluation of all material not having undergone final field testing.

3. Arrange for large scale implementation at each Developing Institution.

4. Bring to final production and arrange for appropriate reproduction all instructional units which have reached a stage of final field testing. Such materials will require the reproduction of booklets, videotapes, audio tapes, filmstrips, slide programs, and films.

5. Develop a design for evaluation of total instructional sequence with on-site modification as needed.

Team II. Out-Reach Team. The major objectives of this team will be to:

1. Plan, schedule, and arrange for on campus workshops for each Developing Institution. These workshops will be designed to involve all faculty members at each institution.

2. Sponsor through the summer and coming year a series of teacher education seminars and workshops for faculty members of other colleges and educational agencies in the region. These seminars would deal with such topics as instructional objectives, individualized instruction, instructional media, laboratory controlled teaching, simulation, interaction analysis, and a review of all instructional materials developed through this cooperative project. Such materials would be made available to each institution upon request and assistance would be provided where possible.

Team III. Protocol Team. The major task of this team will be to:

1. Concentrate on locating and designing protocol materials for the area of special methods. These team members will be selected from areas of social studies, mathematics, science, and the fine arts.

2. Identify and design instructional procedures for non-classroom teacher behaviors.

3. Plan and conduct, in cooperation with Team II, an end-of-summer workshop for special methods instructors from the four cooperative institutions and other invited college faculty and educational personnel.

Team IV. Student Teaching Team. The function of this team will be to:

1. Explore the role and function of student teaching experience within the context of the total teacher education program.

2. Investigate possible alternatives such as micro-teaching, controlled laboratories, or simulation techniques as suitable replacements of student teaching experiences.

3. Plan, design, and formulate instructional strategies to serve as instructional models for use with student teacher.

4. Examine the role of the teacher as a member of a differentiated teaching staff consisting of levels of personnel including paraprofessionals.

5. Explore possibilities for initating and formulating adequate and appropriate student teaching centers as a cooperative basis.

PHASE VIII.

Time Period: September 1970 through May 1971.

Place: Campus of West Virginia University and campuses of Developing Institutions

Mission: Each participant will return to his respective institution. Through the year he will continue his assignment to a specific team with the responsibility for carrying out the program and objectives of that team as they relate to his institution. The tasks to be accomplished by each team through the academic year will be a continuation of plans and projects initiated the previous summer. These tasks by teams are anticipated to be somewhat as follows:

Team I. Production and Field Testing.

1. Through the academic year this team will continue the reproduction of all material in final form.

2. Place in final production those materials which reach final field testing through the academic year.

3. Plan and carry through large scale implementation at all campuses.

4. Prepare instruction units for dissemination to other colleges and educational agencies throughout West Virginia.

5. Conduct an evaluation of material as implemented at each institution.

Team II. Out-Reach Team.

1. Plan and sponsor workshops on campuses of Developing Institutions. The intent of these workshops is to inform and involve faculty members from other divisions of the institution. In large part these faculty members relate directly to the teacher education program and must be intergrated into the on going curriculum development.

2. Plan and sponsor regional seminars and workshop for faculty members from nearby colleges and educational agencies. It is proposed that these would be held on the campuses of the Developing Institutions and would serve other colleges and educational agencies in the immediate area. Such a design would permit reaching most other private and public colleges throughout West Virginia.

3. Carry out plans for the dissemination and distribution of published materials to all interested colleges.

4. Arrange for any special meeting of all project teams or other special groups. It is possible that special conferences could be scheduled around some specific theme of particular interest to all institutions.

Team III. Protocol Team.

1. Continue the task of locating and developing protocol material with regard to different aspects of teacher education.

2. During the academic year team members will serve as leaders on their campuses for acquiring and using protocol materials.

3. Continue efforts to identify and develop instructional materials for non-classroom teacher behaviors.

4. Arrange, in conjunction with Team II, necessary workshop to involve faculty members in special methods and other academic areas of the institution.

Team IV. Student Teaching Team.

1. Continue the examination of the role of student teaching at each campus.

2. Begin the design of controlled laboratory situations for micro-teaching experiences.

3. Begin the production and acquisition of model behaviors for in controlled laboratory settings.

4. Join with other institutions in the discussion, planning, and implementation of appropriate student teaching centers.

II. AN HISTORICAL ACCOUNT OF THE REVISED PLAN

A major concern of the Project leadership has been the limited Federal funding which has made certain modifications necessary in the objectives submitted in the original proposal. For example, the 1968-69 Fiscal Year Grant represented a reduction of thiry-one-thousand dollars; consequently, the objectives in Phase V and Phase VI were modified to be commensurate with the allocation of funds. A greater reduction in funding during Phase VII and Phase VIII necessitated the complete revision of the objectives

The following content represents an historical progress report that should give the reader insight into the objective modifications, the modified operations, and the general progress of the project after the reduction in funding.

Phase I - Summer 1967

Personnel participating in the summer phase of the Developing Institutions Project first assembled on the West Virginia University campus June 12, 1967. The group consisted of four faculty members from each of the State Colleges and West Virginia University. Physical facilities were provided for the project in a University owned house on the Evansdale Campus. The group met daily at this location throughout the summer.

The first task of the project team through the early weeks was to devise a satisfactory means of evaluating the subsequent impact of the project on teacher education programs at the various schools. Two evaluation schemes were devised. First, data were collected on all courses and course activities offered at each institution through the academic year 1966-67.

These data were collected as base data against which subsequent change could be measured. The second plan of evaluation consisted of small experimental studies designed to measure the achievement of students as they were exposed to new media and instructional programs.

Once having devised a plan of evaluation, the projects members turn their attention to the main task of Phase I. The objectives, as set forth in the proposal, were as follows:

1. Develop operational goals to be achieved in the content areas, i.e., what behavioral qualities, skills, ability, knowledge, etc., do we expect students to possess as a result of the instructional experience in teacher education.
2. Initiate a comprehensive inventory of relevant resources, both human and technological relevant to the immediate and long mission of the project.
3. Specify alternate instructional approaches hypothesized as effective in achieving specified goals.
4. Engage in a pilot development effort in three or four areas, such as programmed instruction, a concept film, a television tape, or a series of case studies.

A major part of the work through the summer months was done in small groups. Members of the project staff decided to concentrate their efforts in five content areas common to teacher education programs prior to student teaching. These content areas as defined by the group were:

Instructional Objectives
Learning
Development
Measurement and Evaluation
Classroom Control

A small group of project members were assigned to each area. Each area had members that were representative of the schools in the project and of the subject areas included. The specific task of each group was to identify instructional units within each content area. Once these units were identified, each group proceeded to prepare operational objectives for the instructional units and prescribe appropriate instructional activities for the involvement of students. In addition to the preparation of objectives and instructional activities, each group constructed criteria tests for determining when objectives had been met. At the close of the summer, instructional units had been prepared for pilot testing in the areas of Instructional Objectives, Learning and Measurement. In addition to these, visual materials were prepared for use in Development and Classroom Control.

The major problems encountered through the summer phase of the project were financial and orientation of project staff. The first problem resulted from the fact that the project began its operation on June 12 while funds for the project were not received from the federal government until August. This situation proved to be a particular hardship for the three State Colleges who were unable to finance their project staff through the entire summer. This problem was finally resolved by assistance from the West Virginia University Foundation. The Foundation was able to advance the project sufficient funds for faculty salaries and other operating costs.

The second major problem of operation through the summer was one of pulling the diverse staff, representing different institutions, together in terms of program objectives. Although this task was not totally accomplished, sufficient progress was made to permit significant accomplishment. The use of off-campus consultants and appropriate visual materials were most helpful in assisting members of the project overcome problems in this area.

Phase II - Academic Year 1967-68

The project moved into its second phase beginning with the opening of school in September. At this point, three members from each summer team returned to their respective campuses while one member from each school remained on the West Virginia University Campus.

The specific objectives for Phase II as stated in the proposal were:

1. Initiate faculty discussion at the developing institution regarding the operational goals to be achieved as developed by the total team during the prior summer.
2. Complete, development and initiate field test of pilot efforts begun during the prior summer.
3. Place a second series of pilot projects in the development stage.
4. Conduct a comprehensive review of the master plan of work including goals.

The first object in this phase is to be accomplished by a series of meetings of the project team at each of the developing institutions. The discussions at these meetings are to include the total faculty of the division of education at that institution. One such meeting has been held at Fairmont State College with another scheduled at West Virginia State College in mid-year and one at Shepherd College in the spring. An audio and visual program on the objectives at the project was prepared through the summer for special use with the faculty members at each developing institution.

At West Virginia University three instructional units are being field tested through the first and second semesters in an automated instructional setting. These units in Instructional Objectives, Learning, and Measurement are also being field tested at the developing institutions with different modes of instruction. In addition, each institution has undertaken the completion of some project, such as in Development at Fairmont State College, or has initiated a new project to be carried through this academic year. Shepherd College has launched a program in their introductory course in Education and in their classroom observations for students in courses prior to student teaching. West Virginia State College, on the other hand, has initiated an effort to develop concept films of children through the pre-adolescence years.

The final task to be accomplished at the close of the year will be a comprehensive evaluation and review of the project in terms of its goals and accomplishments.

The major problem confronting the project through Phase II has been the difficulty of coordination. It has been considered important that each school not lose its identity with the project as a whole, but at the same time be permitted to make necessary adjustments in staff and focus the attention of its staff on the particular needs of the institution. In large measure this difficulty has been overcome by identifying smaller projects that are within the scope of the proposal yet within the interests and capabilities of an individual institution.

Coordinators and project members, at this point, register expressions of satisfaction in regard to the over all accomplishment and progress of the project. In most cases, it is fair to say, that the accomplishments of the project to date surpass the expectations of the group at the beginning of last summer. Each school, as a result of the efforts of this project, has initiated significant and meaningful changes in its instructional program. In spite of this progress much remains to be done. Nevertheless, the project has provided the momentum, confidence, desire, and to some extent the capability to complete the tasks that remain to be done.

Phase III - Summer 1968

Four faculty members from each of the three developing institutions came to the campus of West Virginia University to join four faculty members from the cooperating Universities to plan the development of instructional programs and materials.

The project team divided into the following four areas of concern:

1. Development
2. Special Methods
3. Media
4. Statistics

with the intent of conceptualizing an agreeable list of objectives and developing content in each of the four areas of concern.

Group Analysis. The Development Group worked in the area of teacher competence. After an agreeable list of competencies was written, the Group began working on the content area of development. This content building will be continued by the members of the Group on their own campuses through Phase IV.

The Special Methods Group wrote teacher competencies in general and special methods. They prepared a HANDBOOK FOR SUPERVISING TEACHERS. The handbook was used at West Virginia State College during Phase IV. Several video-tape lectures in special methods were produced. They were model lectures in special areas to be use in special or integrated methods.

The Statistics Group rewrote the measurement unit which will be field tested during Phase IV. New units were prepared - Descriptive Statistics and Standardized Tests. They will be field tested second semester at West Virginia University during Phase IV.

The Media Group used the video-tape equipment in the summer elementary school. They prepared a unit on Concept Development for use in special methods. The unit was designed to show concept development of the same concept at different levels of study and difficulty. The concept used was greater than-less than.

Phase IV - Academic Year 1968-69

Work on instructional units was continued on the campuses of the respective institutions and the campus of West Virginia University. Personnel from each of the developing institutions served on the Project Staff approximately one-third of the time at their respective institutions while four faculty members from the cooperating University continued to work one-third time with one full time member from each developing institution on the campus of West Virginia University.

The efforts of project members have resulted in the development and implementation of a number of self-instructional units for use in the undergraduate teacher education program. The units have been developed incorporating student response modes, media, and evaluation. Most units have been field tested and revised in the undergraduate program at West Virginia University and at other schools. The units developed to date are:

1. Writing Instructional Objectives
2. Principles of Learning
3. Measurement: Teacher-Made Tests
4. Descriptive Statistics
5. Standardized Tests
6. Growth and Development
7. Classroom Management
8. The use of Audio-Visual Equipment

The development of the above units has involved the making of tapes (audio and video), films, slides, filmstrips, transparencies, and the use of other media techniques.

In addition to the development of material, the project has experimented with an implemented new approaches to instruction. The four institutions are moving toward the use of learning resource centers where material is presented by media and where students can progress at individual rates. Furthermore, performance levels have been prescribed through all units as a means of assessing student achievement.

The cooperative arrangement has also provided opportunity for the four schools involved to experiment, and to some extent, adopt, new approaches to teacher education. These approaches have been incorporated at different points in the respective programs but all are being used to some extent. Approaches which have been examined and modified for use in different programs are:

1. Interaction Analysis -
   Flander's System
   Ober's Reciprocal
   Category System
   Florida Taxonomy of Cognitive Behavior
2. Micro-teaching -
   Reduced teaching in a controlled laboratory situation
3. Simulation -
   In-basket technique using student records
   Classroom situations on 16mm film
   Classroom situations on 8mm loops
4. Precision Teaching -
   An observational system for pin-pointing classroom behavior and technique for modifying student behavior

The cooperative arrangement, founded under Title III of the Higher Education Act has made it possible for each of the four schools involved to make major strides in restructuring their undergraduate teacher education program. Without this cooperative effort, the development of these programs would not have been possible.

Phase V - Summer 1969

Fairmont State College, Shepherd College, West Virginia State College and West Virginia University were involved in a cooperative effort designed to make significant changes in the undergraduate teacher education program at the respective institutions.

The summer and academic year program reported represent the third year of support of a continuous project begun during the summer 1967. Reported here are Phase V and VI as outlined in the original proposal submitted for finding under Title III, Higher Education Act in November 1968.

The objectives as setforth in the proposal for Phase V (Summer) were as follows:

1. Arrange for appropriate reproduction of effective materials, devices or other innovative products.
2. Complete assessment and development of plans for implementation through Phase VI.
3. Plan experimental implementation and evaluation of total instructional sequence with on-site modification as indicated.
4. Develop capability for large scale field test in the fall.

The summer program was carried out on the campuses of the Developing Institutions and the cooperating university. The project team at each institution spent considerable time in assessing its undergraduate program and establishing specific priorities for implementation and development.

Shepherd College set as a priority the improvement of instruction and increased use of audio-visual materials and equipment. Programmed units with individualized stations were established for student instruction.

A second major goal at Shepherd College was the tentative planning for student teaching centers.

The staff at West Virginia State College spent a portion of the summer on its own campus in order to asssess itsprogress and re-established working goals for the remaining year. The major goals established were:

1. Redevelopment of Education 101 including behavioral objectives, team teaching, and units of mediated instruction.
2. Implementation in Education 201 and 202 including refining sets of objectives, evaluation of laboratory materials and activities.
3. Complete preparations for tests and measurements component of self-instructional competency laboratory.
4. Begin and implement micro-teaching.

Members of the project team at Fairmont State College spent a portion of the summer on their own campus primarily working with faculty members in the area of General and Special methods. A workshop was conducted for these faculty members including instruction and assistance in writing behavioral objectives, educational taxonomy, the procedure of micro-teaching and evaluation.

In addition to the program carried out on the campuses of the separate colleges, the project team from each college came to the campus of West Virginia University for planning and material development. Collectively, team members assessed instructional materials, and developed plans for implementation and field evaluation.

Phase VI - Academic Year 1969-70

The objectives, as defined in the original proposal for Phase VI (academic year) were as follows:

1. Continued field testing of instructional units through a second phase.
2. Plan material for development in areas where survey indicates deficiencies in sequence.
3. Place in final production all instructional material ready for dissemination and implementation on campuses of developing institutions.
4. Sponsor a conference on teacher education.

The activities of the project teams were in large part carried out on the campuses of the developing institutions. Of priority through this phase was the continued field testing of instructional units which at this stage were in a second phase of development and refinement. Included in this process of refinement were materials in the Behavioral Objectives, Measurement and Learning Units. As a result of this refinement and testing, these units were brought to a beginning stage for final production.

Each institution continued to implement in areas where material was prepared and continued to meet as groups for on going assessment and future planning.

A conference was held in the spring at Mont Chateau, Morgantown, West Virginia. The conference presented an opportunity for demonstration of Mini-course materials developed by the Far Western Laboratory. Film from Critical Moments in Teaching were also demonstrated by Dr. David Gliesman from Indiana University.

Films from the Critical Moments in Teaching and Learning Systems Inc. were subsequently purchased for use in courses at the various institutions.

In general, the objectives set forth for the year were accomplished. The one major set back was limited funding which made certain modifications necessary. Funds did not permit one team from each developing institution to remain on the West Virginia University campus through the academic year as proposed. However, the use of National Teaching Fellows at each institution made released time possible for team members at the respective campuses.

Phase VII - Summer 1970

Fairmont State College, Shepherd College, West Virginia State College, and West Virginia University are involved in a cooperative effort in the development, field testing, evaluation, and implementation of newer modes of instruction in undergraduate teacher education programs at each respective institution.

The summer and academic year program reported represents the fourth year of support of a continuous project begun during the summer 1967. Reported here are Phase VII and VIII as outlined in the original proposal submitted for finding under Title III, Higher Education Act in November 1968.

A Federal cut-back in funding necessitated a revision of the objectives listed in the original proposal. The revised listing of objectives for Phase VII (Summer) and Phase VIII (1970-71 Academic Year) were as follows:

1. Survey, evaluate, and bring to final production all instructional units which have reached a stage of final field testing;
2. Arrange for large scale implementation and evaluation of the total instructional sequence with on-site modification as needed;
3. Plan, schedule, and arrange for on campus workshops for each Developing Institution;
4. Develop a design for the evaluation of the total instructional sequence with on-site modification as needed.

The summer program was carried out on the campus of West Virginia University. The main task was to bring to final production all instructional units in preparation for a five day cooperative workshop for coordinators and faculty of the participating institutions to be held at West Virginia University.

Instructional coordinators met in a pre-workshop and selected a date for the workshop and listed the following high priority workshop objectives:

1. To review and select for institutional use the revised editions of over 50 project produced instructional activities;
2. To cooperatively discuss implementation techniques for the instructional films purchased by the project;
3. To finalize tentative plans for the mass reproduction, packaging, and dissemination of written and mediated project produced materials;
4. Develop a design for the evaluation of the total instructional sequence with on-site modification as needed.

Several follow-up coordinator's conferences held during Phase VIII were helpful in the cooperative solution of certain problems. These solutions were largely responsible for an acceleration in production rate that made it possible for all instructional materials to be in the hands of institutional faculty by the second semester 1971.

Institutions implemented the instructional materials according to the design that each institutional coordinator and faculty had developed during the preceding phases of the project. A project field representative was made available to help in the implementation of those materials and aid in the design of field tests. It was his task to make a series of visits to each institution with the intent of offering assistance during the field study period.

Each institution is in the process of field testing various units of the instructional materials. The institutions are looking at the efficiency of the materials as measured by learning gain, learning rate, and student reaction to the materials.

The modified objectives set forth for the year were accomplished. The one major set back for this project was limited funding which made certain modifications necessary. Funds did not permit teams from each developing institution to remain on West Virginia University campus during Phase VII and did not permit the realization of all objectives submitted in the original proposal.

An analysis has been designed during the funding period for the evaluation of the Developing Institutions Project. Both institutional coordinators and the project field representative have devoted a great deal of time in the design of the analysis format and the partial selection of data for the evaluation of the project at the termination of this funding period.

III. GROUP MEETINGS

Group meetings played an important role in the development of instructional models, in the development of content, and in the accomplishment of general project objectives. These cooperative meetings maximized the effective use of institutional resources of each of the four institutions. In addition, the cooperative meetings brought together project membership to exchange ideas and materials that dealt with educational programs in general and project related programs in particular. The meetings also provided an opportunity for visiting speakers and consultants to generally assist in the conceptualization and development of ideas and specifically to assist project personnel with each different phase undertaken. Finally, the group meetings provided an opportunity for faculty who attended special meetings and workshops to report educational developments in other areas of the country and how these ideas may be included in this project.

Since the consultants played such an important role in these meetings, they will be listed first; the special meetings attended by institutional faculty that had input at these group meetings will be listed second; the group meetings described last.

Consultants involved in group meetings.

1. Dr. Dewight Allen
   Topic: Micro-teaching
2. Dr. Bob Brown, University of Florida
   Topic: Experimentalism in Teaching Practices
3. Dr. Ann Duncan, Yeshiva University
   Topic: Precision Teaching
4. Dr. Jack Frymier, Ohio State University
   Topic: Teaching Effectiveness
5. Dr. David Gliesman, Indiana University
   Topic: Protocol Material
6. Dr. John Haney, University of Illinois
   Topic: Characteristics of Media in Instructional Development
7. Dr. Jack Kounin, Wayne State University
   Topic: Analyzing Non-Verbal Behavior
8. Dr. Harold Cowen
   Topic: Contingency Management
9. Dr. Richard Neville, University of Maryland
   Topic: Curricular Patterns in Higher Education
10. Dr. Margaret Sweeney
    Topic: Analysis of Classroom Interaction

11. Dr. Robert Soar, University of Florida
    Topic: Research Findings from Systematic Observation

12. Dr. Donald Stewert
    Topic: Mastery Learning

13. Dr. Jeannine Webb, University of Alabama
    Topic: The Florida Taxonomy of Cognitive Behavior

Special Meetings that were attended by institutional faculty and reported at group meetings.

1. Mr. James Priester to University of Maryland, Maryland
   Purpose: To attend seminar on analysis and modification of teacher behavior

2. Dr. Rogers McAvoy to Webber State College, Ogden, Utah
   Purpose: Analysis of Webber State College's self-instructional program

3. Mr. William Phillips to Marshall University, West Virginia
   Purpose: To attend workshop on non-verbal communication

4. Dr. Backus and Mr. Freeland to Point Pleasant
   Purpose: To attend workshop on Educational Technology in Higher Education

5. Dr. Rogers McAvoy to Duluth Program, Minnesota
   Purpose: Analysis of Duluth Individualized Instructional Program

6. Mr. Freeland to Altonna Conference, Pennsylvania
   Purpose: To attend workshop on Dial Access, Retrival, Computerized, and Educational Systems

7. Mr. Koontz to Chadron State College, Nebraska
   Purpose: Analysis of ITV Programming and Facilities

8. Dr. Scott to Florida Atlantic University
   Purpose: Analysis of ITV Programming, media center, and mediated instruction

9. Mr. Neil and Mr. Freeland to Charleston, West Virginia
   Purpose: To attend workshop on "Secondary-Audio-Visual Systems"

10. Dr. Scott and Dr. Baker to Kent State University and Ohio State
    Purpose: Analysis of media centers and ITV

11. Mrs. Abnathy to ACEI Meeting in Atlantic City
    Purpose: To attend workshop on: "Media for Early Childhood Education Programs"

12. Dr. Scott to Columbia University
    Purpose: To attend conference in "Curriculum and Media"

13. Mr. Neil, Mr. Freeland, and Dr. Backus to West Virginia State
    Purpose: To attend audio visual workshop

Group Meetings:

Time: Summer 1967

Place: West Virginia University

An in-service workshop was held for project personnel and institutional faculty assembled at the campus of West Virginia University during the summer of 1967. The project group consisted of four members from each participating institution. The intent of the in-service workshop was to present in seminar fashion conten' by experts in the areas of technological approaches to learning.

The following seminars were presented:

Dr. Dewight Allen	"Micro-teaching"
Dr. Donald Stewert	"Mastery Learning"
Dr. Harold Cowen	"Contingency Management"

Time: October 9-10, 1967

Place: Fairmont State College

The intent of this meeting was to inform the general faculties of all participating institutions of the progress of the project and to give each faculty member an opportunity to participate in the discussion and direction that the project will take. In addition, some of the more recent techniques that are being used in teacher education programs in various sections of the country were demonstrated.

The following seminars were presented:

Dr. Jack Bond - Simulating Techniques - Films from the University of Oregon

Miss Margaret Sweeney - Analysis of Classroom Interaction - Flander's Interaction Analysis

Dr. Mary Yeazell - In-Basket Techniques - Material for pupil characteristics

Dr. Rogers McAvoy - Micro-teaching - Video-tape from Stanford University

Time: April 1920, 1968

Place: Shepherd College

The intent of this meeting was to inform faculty and project members of the progress of materials development that took place in the sub-projects at each participating institution. In addition, advanced techniques in the use of micro-simulated techniques were demonstrated.

Dr. Richard Neville, University of Maryland
Topic: Technology in the Classroom

Time: Summer 1968

Place: West Virginia University

An in-service program was conducted during this summer session in the area of curriculum design. Dr. Bill Moore from Bucknell University presented content in seminar fashion that dealt with the design of curricula for teachers in higher education.

In addition, progress reports were given and the materials developed in the sub-projects demonstrated.

Time: October 28-29, 1968

Place: West Virginia University

Five of the top people in systematic observation participated in a two day conference at West Virginia University. The meetings were well attended by faculty members from each participating institution.

The following topics were discussed in seminar fashion:

Measurable Outcomes with Systems of Observation
    Dr. Rogers McAvoy, West Virginia University

Experimentalism in Teaching Practices (Teacher Practices Observation Record)
    Dr. Bob Burton Brown, University of Florida

A System for the Analysis of Verbal Interaction
Dr. Richard Ober, West Virginia University

Teaching Effectiveness - Our Most Urgent Problem
Dr. Jack Frymier, Ohio State University

Research Findings from Systematic Observation
Dr. Robert Soar, University of Florida

The Florida Taxonomy of Cognitive Behavior
Dr. Jeannine Webb, University of Alabama

Analyzing Non-Verbal Behavior
Dr. Jack Kounin, Wayne State University

Time: Summer 1969

Place: Fairmont State College

Topic: General and Specific Methods Workshop

The Fairmont State College group met and planned and had a one week workshop for their General and Specific Methods Teachers. This workshop covered the following: (1) Introduction to Behavioral Objectives led by Dr. Rogers McAvoy of West Virginia University (2) Writing Behavioral Objectives led by Dr. Julie Vargas of West Virginia University (3) Applying a Taxonomy of Educational Objectives led by Dr. Harry Scott of West Virginia State College (4) A Procedure for Using Micro-Teaching led by Harry Priester of Fairmont State College and (5) Evaluation led by Dr. Mary Yeazell of West Virginia University.

The Project Team members worked with the General and Specific Methods teachers to write behavioral objectives in their disciplines.

The General and Specific Methods courses were reviewed and new outlines were developed so as to be coordinated but yet not conflict and overlap.

A faculty member was sent to a workshop called "Analysis and Modification of Teacher Behavior" at the University of Maryland designed for College and School personnel engaged in pre-service or in-service teacher education and teachers interested in procedures for self-appraisal of performance. Participants studied and used systems for the analysis of teaching. Microteaching, video-typed models, simulation and Micro-Supervision were all studied and used.

Time: May 27-28, 1969

Place: West Virginia University

The primary emphasis of this meeting was the introduction, demonstration, and discussion of innovative techniques for project members and faculty members that were being used at other institutions of learning. Dr. Ann Duncan, Yeshiva University and Dr. John Haney, University of Illinois, experts in Media and Percision teaching, led discussions and work sessions during this two day conference.

The following seminars were presented:

Characteristics of Media in Instructional Development
    Dr. John Haney, University of Illinois

Tele-Lecture - C & P Telephone Company

Coordinators - Robert F. Kennedy Youth Center

Precision Teaching
    Dr. Ann Duncan, Yeshiva University

Demonstration of materials and/or projects from various institutions.

Time: April 27-28, 1969

Place: West Virginia University

This conference presented an opportunity for the demonstration of Minicourse materials developed by the Far Western Laboratory. In addition, Dr. David Gliesman from Indiana University led a general discussion on Protocal Material and demonstrated how to effectively use film from "Critical Moments in Teaching."

Other advanced techniques were demonstrated by project members and faculty from the participating institutions were given an opportunity to become involved in using these techniques and to participate in general discussions.

The following seminars were presented:

Demonstration Of:

Mini-course Material
Effective Questioning
Developed by Far Western Laboratory
Published by MacMillan Educational Services Inc.

David Gliesman, Indiana University

Critical Moments in Teaching

Protocal Material

Time: July 20-25, 1970

Place: West Virginia University

Instructional coordinatiors met in a pre-workshop and selected a date for the workshop and listed the following high priority workshop objectives:

1. To review and select for institutional use the revised editions of over 50 project produced instructional activities;
2. To cooperatively discuss implementation techniques for the instructional films purchased by the project;
3. To finalize tentative plans for the mass reproduction, packaging, and dissemination of written and mediated project produced materials;
4. To cooperatively discuss the implementation and field testing of the materials selected by each participating institution.

Project members worked over a period of five days to accomplish these objectives and, in addition, to review additional commercial materials that were made available.

During this workshop, Mr. Lachicotte of Science Research Associates presented "Inner-City Simulation Laboratory" materials. "Critical Moments in Teaching" Films were also available for review.

IV. GENERAL ACCOUNT OF INSTITUTIONAL FACULTY INVOLVED IN THE PROJECT

West Virginia University

Baker, Sheldon R., Assistant Professor

A.B.	Ohio State University,	1950
M.A.	Ohio State University,	1952 (Sociology)
M.A.	Ohio State University,	1958 (Psychology)
Ed.D.	Western Reserve University,	1962 (Educational Psychology)

Bond, Jack H., Assistant Professor

B.S.	Eastern Oregon College,	1956
M.S.	Oregon College of Education,	1964
Ed. D.	University of Oregon,	1967

Fraley, Lawrence, Assistant Professor

B.A.	University of Colorado,	1959
M.B.S.	University of Colorado,	1960
Ed. D.	University of Southern California,	1969

Hale, Robert E., Instructor

B.S.	West Virginia University,	1961
M.M.	University of Tennessee,	1965

McAvoy, Rogers, Associate Professor and Chairman, Department Educational Psychology and Measurement

B.A.	Fairmont State College	1951
M.A.	West Virginia University	1954
Ph.D.	Indiana University	1966

Tseng, Meng-shu, Assistant Professor

B.S.	Taiwan Provincial Chang Kung University,	1950
M.S.	Indiana University	1963
Ed.D.	Indiana University	1964
Post Doctoral Study	Indiana University	1964-66

Vargas, Julie S., Assistant Professor

B.A.	Radcliffe College,	1960
M.A.	Teachers College, Columbia University,	1962
Ph.D.	University of Pittsburg,	1968

Yeazell, Mary F., Assistant Professor

B.S.	Southern Illinois University,	1953
M.S.	Southern Illinois University,	1955
Ed.D.	University of Illinois,	1966

Fairmont State College

Mr. James Amos

Dr. Eugene Arnold

Dr. Paul Clarke

Dr. Edmund Collins

Mr. Galen Duling

Mr. Neil Frye

Mrs. Clara Marple

Mr. William Phillips

Mr. Harry Preister

Dr. Leo Taggart

Shepherd College

Dr. Howard Backus

Dr. Charles Freeland

Dr. Carroll Palmer

Mrs. Joanenell McNealy

Mr. Donald Neil

Mr. Jerry Smith

West Virginia State College

Mrs. Elagne Abnathy

Mr. Donald Baker

Dr. Pearl Brod

Mrs. Mildred Fischer

Dr. Mary Hall

Mr. Aikert Kalme

Dr. David Koontz

Dr. Isaiah Owen

Dr. Maudene Saunders

Dr. Harry Scott

CHAPTER III

DEVELOPMENT and IMPLEMENTATION of an INSTRUCTIONAL DESIGN and CONTENT

Historically, technological advancements used in teaching have been extensions of the teacher. Starting with the medieval technology of chalk, blackboards, models, and charts, to the books of the Renaissance Period, and still later to photographs, filmstrips, slides, films, radio, and television of the First Educational Revolution, all have been extensions of the teacher's power of exposition. They have allowed the teacher to extend his instructional range by bringing into the classroom supplementary information of many kinds.

Since the 50's, new patterns have emerged in educational technology. The production and refinement of new media as primary instruments of instruction, and the control of learning by remote control of stimulus and response has given the instructor more control of the learning environment. Mediated feedback, a diverse efficient range of hardware, advanced methodological approaches, and the introduction of self-instruction have potentially extended the teacher's instructive flexibility and capability. Examples of potential instructional diversity are as follows:

1. media as primary instruments of instruction
2. mediated feedback of performance activities a student might do as a result of cognitive skills learned in a classroom;
3. educational television;
4. primary, supplementary, and enrichment content that may now be presented in a mode that meets the needs of the learner; and
5. a range of media that varies from a device for a lesson presentation to one of a complete system of remotely controlled instruction covering an entire course.

These potentialities have not been fully exploited in education in general and in higher education in particular.

Since the introductory work of the 50's very little has been done with the refinement of this general instructional approach. In light of this omission, the Developing Institutions Project set as its objective the further development, refinement, and application of the technology of the 60's with instructional principles of the 70's in an effort to upgrade instruction.

I. A PERFORMANCE CURRICULUM IN UNDERGRADUATE TEACHER EDUCATION

A General Performance Design

Attempts to patch existing undergraduate teacher education programs designed from a model which assumes that a student should complete a series of foundation courses before entering a course in methods of teaching would be fruitless. The lack of tight relationships between the content of lessons and the task of teaching in addition to the misuse of basic learning principles in the operation of the approach led the project membership to reconstruct an instructional design that involved the following developmental principles:

1. analysis of objectives into behavioral terms;
2. breakdown of material into logical steps;
3. media suited to objectives;
4. continuous student involvement;
5. translation of cognitive learning into performance;
6. feedback and knowledge of results made available to instructors and students;
7. assessment and validation of programs.

Specifically, what was in order to offset the deficiencies in teacher education was an instructional model that:

1. would incorporate basic principles of learning in all its aspects and operations; and
2. would permit the student an opportunity to translate his cognitive learning into performance at a time when the concept is first acquired.

The experimental situation in the Developing Institutions Project provided an opportunity to formulate this instructional model and field test its effectiveness.

This opportunity became a reality when a series of consultants were made available in conferences and workships throughout the first summer, to assist institutional personnel in the conceptualization of a general performance curriculum for undergraduate teacher education that would meet the needs of institutional instructional programs.

The performance design was by plan an open ended model. Each institution had specific needs that could only be satisfied with a design that was psychologically sound, a design based on learning principles, and a design flexible enough to be used in a variety of situations. Therefore, an open ended model that was based on the aforementioned developmental principles was agreed upon.

The performance curriculum designed by the project may be described as one that allows the student to translate learning into performance at a time when a concept is first acquired. In addition, the design assigns to the instructor the task of providing the content that is appropriate for student behaviors defined in the behavioral objectives (the output). In this instructional system the learner is provided with a feedback from his own output. From this feedback, the learner devises an immediate knowledge of results which reinforces and facilitates the learning process. At the same time, through feedback from the learner's performance, the instructor is able to evaluate the efficiency of his instructional system and modify it.

Other feedback loops make provision for student evaluation of course content and methods. In summary, feedback capability is an important technique in the instructional design.

Figure 1 may be helpful in the reader's understanding of the feedback process that is a basic component of the performance design:

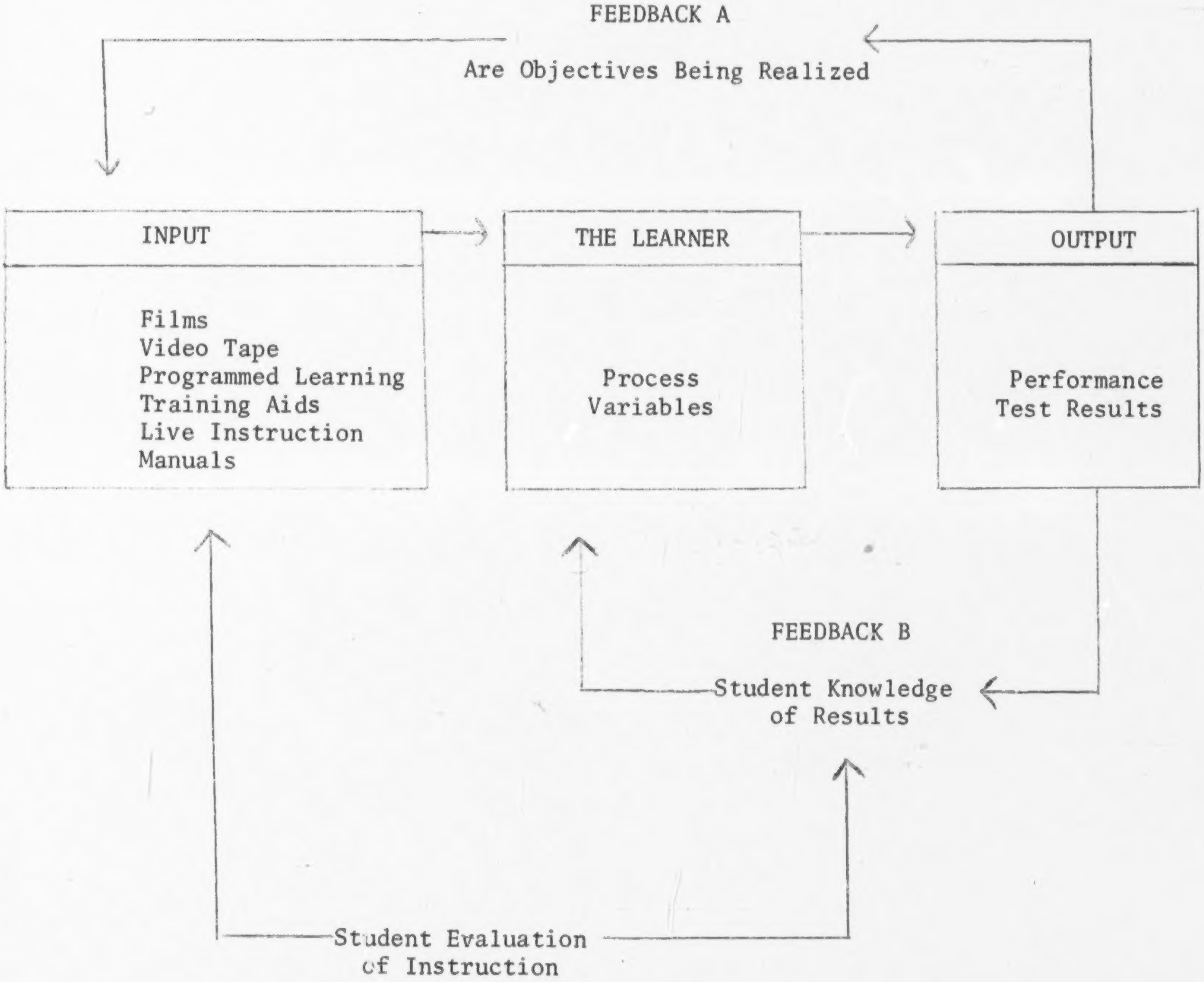

Figure 1. Feedback management in the performance curriculum.

In addition the performance design specified the following design behaviors:

1. analyze and breakdown content into specific behavioral objectives;
2. devise the necessary steps to achieve the objectives;
3. set up procedures to try out and revise the steps;
4. validation of the program against attainment of the objectives.

These teacher design behaviors introduced percision teaching to the performance model and a methodological approach to instruction that would have an impact on hundreds of instructors and thousands of students in education.

Another innovative technique was the introduction of a systems approach that concentrated on student behaviors as a measurable output. Instructional decisions, then, are based on the student's ability to perform precise behaviors and not on a subjective analysis of pencil and paper tests. Changes in the system are observed in the performance level of professional prerequisite behaviors.

In addition, the design includes several other innovative techniques that are basic to the model. They include the mediation of content, student interaction with instructional material, and remedial loops to encourage mastery.

These techniques may be used in any presentation mode without changing the basic nature of the mode. This means that the flexibility of the design will allow model implementation at any institution without changing the nature of the performance curriculum or that presentation mode being used at that institution.

The design is illustrated in figure 2. The controlled student behavioral performance in the learning environment with a variety of supervised and controlled experiences gives the performance curriculum both its uniqueness and superiority.

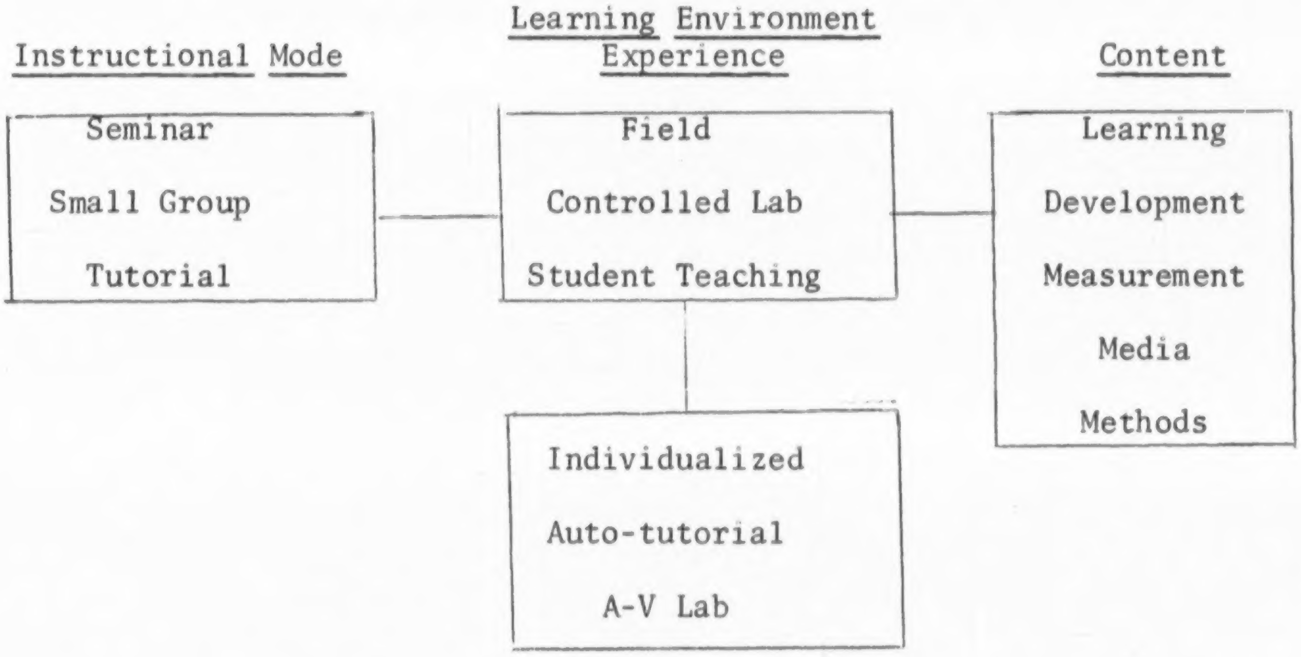

Figure 2. Operational model for a performance curriculum.

Since the design is open ended, its flexibility allows one to implement the model in a variety of instructional modes using an endless number of student experiences and a variety of content topics. For example, this design has been implemented by Fairmont State College and Shepherd College as a supplementary mode of instruction; West Virginia University has implemented the design as an individualized self-instructional system; West Virginia State has implemented the design as a group mode primary content approach and in remedial loops.

The Design of Content

The institutional faculty involved in the project approached the design of content with the following developmental principles as guidelines:

1. Analysis of objectives into behavioral terms: An objective is a goal that the educational system attempts to achieve. An instructional objective is a specific performance students acquire through particular instructional procedures. A behavioral instructional objective identifies the end product of instruction in terms of observable human accomplishments.

2. Breakdown of material into logical steps. The learning task must be presented to the learner in such a way that he will learn it as rapidly and efficiently as possible. This means that content must be divided into small steps that take the learner from his unique entry point in the instructional process through a hierarchy of sequential steps to the criterion level of the objective.

3. Media suited to objectives. Content may be handled more efficiently in one instructional mode than another. Therefore, the objectives dictate the kind of media to be used in the instructional system.

4. Continuous student involvement. Assuming that all conditions are optional, the degree of learning is a linear function of the ratio (time taken/time needed). By creating an instructional situation that allows for continuous student involvement the student rate of learning is increased.

5. Translation of cognitive learning into performance. An individual can have a concept that satisfies an achievement-test question but may not enable him to carry out an adjustmental act in a real situation. A student needs the opportunity to carry each concept acquired to a performance level.

6. Feedback and knowledge of results. Student feedback provides immediate knowledge of results which reinforces and facilitates the learning process. From a classroom management point of view, feedback provides the input for process revisions that are essential for the upgrading of instruction.

7. Assessment of programs. Assessment of programs includes both an analytic and evaluative process. The intent of this process is to upgrade the quality of instruction that is taking place in the classroom. Assessment is a continuous process that utilizes feedback loops in the instructional process.

Each of the programs developed in the project contained the developmental guidelines and could be implemented as programs or combined into units. This plan made possible the implementation of a program, a series of programs, a unit, or a series of units into a course of study without changing the efficiency of the content. This plan made possible maximum flexibility of content implementation.

II. PROJECT PRODUCED and PURCHASED CONTENT

So that the reader will have a better understanding of content flexibility, a self instructional unit concerning "Writing Instructional Objectives" is included next in this section of the analysis along with a complete listing of materials that have been either developed or purchased through the developing institutions project. The "Writing Instructional Objectives" unit will illustrate the use of objectives, the use of project content that is suited to the objectives, the breakdown of material into logical steps, continuous student involvement and the translation of cognitive learning into performance. This particular unit utilizes a primary self-instructional mode of presentation rather than a group, remedial or supplementary mode.

The materials outline which is the last insert in this section of the analysis (INSERT II) lists all project produced and purchased materials. One may choose a student activity or a series of activities in the development of a course of study in an instructional system. In addition, the materials are not limited to one instructional mode nor is 100 per cent application necessary for maximum efficiency. The materials may be used in total or in part and may be implemented according to institutional needs.

INSERT I

WRITING INSTRUCTIONAL OBJECTIVES

GENERAL OBJECTIVE

1.0 The student will be able to write instructional objectives in behavioral terms at different levels of Bloom's Taxonomy of Educational Objectives and teach using those objectives.

Step #1 Take a paper-pencil Pre-test. Check out test at Materials Check-Out Station. ☐

Step #2 Check for your Pre-test score on the Student Progress Chart. ☐

Step #3 Read objectives 1.1 through 1.4. ☐

SPECIFIC OBJECTIVES

1.1 Given two instructional objectives, the student will be able to discriminate between that which is stated behaviorally and that which is not.

1.2 Given a list of ten objectives, the student will be able to select the five which are most behavioral.

1.3 Given an objective not stated in behavioral terms, the student will be able to select from the following list of alternatives that which makes the objective most behavioral.

- A. State the objective in terms of the learner rather than the teacher.
- B. Change unobservable goals to observable behavior.
- C. Specify the level of acceptable performance.

1.4 Given objectives at different levels of Bloom's Taxonomy of Educational Objectives, the student will be able to specify which are at the knowledge level.

INSTRUCTIONAL ACTIVITIES

Complete only those activities determined by your pre-test score. If your Pre-test was between:

Category 1	Category 2	Category 3	Category 4
0 and 50	51 and 74	75 and 89	90 and 100
Do these activities	Do these activities	Do these activities	Do these activities
AA A B F G H	A B F G H	A F G H	You are exempt from the Post-test. Go to Objective 1.5

Step #4 Your Pre-test score was ________. You should complete activities in Category _______.

Step #5 Complete appropriate activities. All instructional materials are to be checked out from the Materials Check-Out Station.

Code	Activity	
AA	How Affective Teaching Goals Relate to Specific Behavioral Objectives. Slide-tape program with response sheet.	☐
A	Writing Worthwhile Behavioral Objectives, Vargas, Julie S. Book. Read Chapters I, II, III.	☐
B	"Setting a Course for yourself and Your Students" Phi Delta Kappa Article Reprint.	☐
F	"A Condensed Version of Bloom's Taxonomy of Educational Objectives" Article reprint.	☐
G	What Is A Taxonomy of Educational Objectives? Slide-tape program with response sheet.	☐
H	Writing Behavioral Objectives at Different Cognitive Levels. Slide-tape program and response sheet.	☐

EVALUATION

Step #6 Take a paper-pencil Post-test covering Objectives 1.1, 1.2, 1.3, 1.4.

Check out test at Materials Check-Out Station. ☐

Step #7 Check the Student Progress Chart for Post-test results. ☐

Step #8 If your score on the Post-test is 90 per cent or higher - GO TO OBJECTIVE 1.5 -- Step #9. ☐

Step #8A If your score on the post-test is less than 90 per cent complete the following remedial activities. ☐

Code	Activity	
AA	*Writing Instructional Objectives*, Mager, Robert Book	☐
C	Stating Behavioral Objectives for Classroom Instruction - Norman F. Gronlund pp. 20-21 and Appendix B.	☐

Step #8B Retake Post-test ☐

Step #8C Check Post-test scores posted on Student Progress Chart. ☐

Step #8D If your Post-test score is 90 per cent or higher - GO TO OBJECTIVE 1.5. ☐

Step #8E If your Post-test score is less than 90 per cent - SEE YOUR GRADUATE INSTRUCTOR. ☐

WRITING INSTRUCTIONAL OBJECTIVES

WRITTEN ASSIGNMENT

SPECIFIC OBJECTIVES

1.5 Given instructional materials of your own choice, the student will be able to derive and write at least 10 behavioral objectives higher than the Knowledge level in Bloom's Taxonomy of Educational Objectives.

Step #9 Read Objective 1.5. ☐

Step #10 Complete Instructional Activity. ☐

INSTRUCTIONAL ACTIVITY

Code	Activity	
A	*Writing Worthwhile Behavioral Objectives.* Vargas, Julie S. Read Chapters IV, V, VI, VII.	☐

ASSIGNMENT

Select a chapter from a textbook in a subject area of your choice, and write ten (10) behavioral objectives higher than the Knowledge level in Bloom's Taxonomy of Educational Objectives. Assignments should be completed on standard sized paper.

EVALUATION

Step #11 Turn in your ten objectives at the Materials Check-Out Station. ☐

Criteria:

Must be stated in terms of the learner.
Must be stated as observable behavior.
Must specify the level of acceptable performance.
Must be above Knowledge level in Bloom's Taxonomy of Educational Objectives.

Step #12 Check for your score on the Student Progress Chart. ☐

Step #13 If your grade on the Written Assignment is an "A" GO TO OBJECTIVE 1.6. ☐

Step #13A If your grade on the Written Assignment is lower than "A", you have the option of:

1. Revising your objectives in order to receive the higher grade.
2. Accepting the lower grade and moving on to OBJECTIVE 1.6. ☐

Step #14 If you elect to revise your objectives, pick-up your original copy at the Materials Check-Out Station. ☐

Step #14A After rewriting, submit your objectives at the Materials Check-Out Station. ☐

Step #14B Check your grade on the Student Progress Chart. ☐

Step #14C If you have a grade of "A" or elect the lower grade, GO TO OBJECTIVE 1.6. ☐

Step #14D If you have a grade lower than "A" you have the option of revising or going on to OBJECTIVE 1.6. ☐

WRITING INSTRUCTIONAL OBJECTIVES

MICROTEACH

SPECIFIC OBJECTIVE

1.6 The student will be able to give a 5-minute microteach using a behavioral objective(s) above the knowledge level in Bloom's Taxonomy of Educational Objectives.

Step #15 Read Objective 1.6. ☐

Step #16 Prepare a written pre-teach proposal that includes the following:

- a. the general concept or principle to be taught.
- b. the grade level to be taught.
- c. the objective(s) to be taught.
- d. the cognitive level of the objective(s) to be taught. ☐

Step #17 Submit the pre-teach proposal at the Materials Check-Out Station. ☐

Step #18 Check for results of the evaluation of the pre-teach proposal on the Student Progress Chart. ☐

EVALUATION

Criteria:
1. Is the objective stated behaviorally?
2. Is the objective higher than the knowledge level?
3. Does the objective agree with the pre-teach proposal?
4. Is the objective a feasible one considering the 5-minute time limit and grade for which it is intended?

Step #19 If your pre-teach proposal is satisfactory, GO TO STEP #21. ☐

Step #19A If your pre-teach proposal is not satisfactory, GO TO STEP #20. ☐

Step #20 Pick up your original pre-teach proposal at the Materials Check-Out Station and make the suggested revisions. ☐

Step #20A Resubmit your pre-teach proposal at the Materials Check-Out Station. ☐

Step #20B Check for results of the evaluation of pre-teach proposal on the Student Progress Chart. ☐

Step #20C If your pre-teach proposal is satisfactory, GO TO STEP #21. ☐

Step #21 Sign-up for a time block and room to give micro-teach at the Materials Check-Out Station. ☐

Step #22 Prior to your scheduled micro-teach, check-out a labeled videotape and pick up your pre-teach proposal at the Materials Check-Out Station. ☐

Step #23 Video-tape your micro-teach. ☐

Step #24 Fill out the label on the video-tape. ☐

Step #25 Turn in the labeled video-tape with pre-teach proposal at the Materials Check-Out Station. ☐

EVALUATION

Criteria:

1. Was the objective stated behaviorally?
2. Was the objective higher than the knowledge level?
3. Did the objective agree with the lesson taught?
4. Was the objective taught within the time limit and at the level intended?

Step #26 Check results of the micro-teaching evaluation on the Student Progress Chart. ☐

Step #27 If your grade on the micro-teach is an "A", TAKE A PRE-TEST FOR THE NEXT UNIT--MEASUREMENT. ☐

Step #28 If your grade on the micro-teach was lower than "A" you have the option of:

1. Re-doing your micro-teach in order to receive a higher grade. ☐
2. Accepting the lower grade, and moving on to the MEASUREMENT UNIT. ☐

Step #29 If you elect to re-do your micro-teach, pick up your micro-teach evaluation at the Materials Check-Out Station. ☐

Step #29A Make suggested revisions and re-do your micro-teach until you reach your desired grade. ☐

Step #30 TAKE A PRE-TEST FOR THE MEASUREMENT UNIT. ☐

INSERT II

MATERIALS OUTLINE

Section I - Education 105, Materials

Unit I Instructional Objectives

Instructional Activities:

copies needed

____ A. Booklet - Vargas
"Writing Worthwhile Behavioral Objectives"

____ B. Article reprint (3 pages)
"Setting a Course for Yourself and Your Students"

____ C. Filmstrip-tape program (response sheet) (Vimset)
"Systematic Instructional Decision Making"

____ D. Filmstrip-tape program (response sheet) (Vimset)
"Educational Objectives"

____ E. Filmstrip-tape program (response sheet) (Vimset)
"Selecting Appropriate Educational Objectives"

____ F. Article reprint
"A Condensed Version of Bloom's Taxonomy"

____ G. Slide-tape program (response sheet - Note Outline)
(Program Produced) "What is a Taxonomy of Educational Objectives?"

____ H. Slide-tape program (response sheet) (Program Produced) "Writing Behavioral Objectives at Different Cognitive Levels"

Remedial Activities:

____ RA. Book - paperback
Preparing Instructional Objectives - Mager - Ferrow Publishers, $1.75.

____ RB. Article Reprint - Esbensen
"Writing Instructional Objectives"

____ RC. Filmstrip-tape - Esbensen
"Writing Instructional Objectives"

Unit II Measurement

Instructional Activities:

copies needed

____ I. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Introduction to Measurement"

____ J. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Evaluation of Behavioral Measures"

____ K. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Writing Test Items at Various Cognitive Levels"

____ L. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Choosing Specific Types of Test Items"

Remedial Activities:

____ RI. Booklet (Program Produced)
"Measurement"

____ RJ. Filmstrip-tape program (response sheet) (Vimset)
"Evaluation"

____ RK. Filmstrip-tape program (response sheet) (Vimset)
"Modern Measurement Methods"

____ RL. Worksheet
"Writing Test Items"

Unit III Learning

Instructional Activities:

____ M. Paperback book
Science and Human Behavior - Skinner - The Free Press; New York $2.95.

____ N. Paperback book
The Analysis of Behavior - Holland & Skinner - McGraw Hill Book Co., New York.

____ O. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Learning Lecture I"

____ P. Article reprint
"How To Teach Animals" - Skinner

____ Q. 16mm Film - Educational Psychology
"Programmed Instruction"

____ R. 16mm Film (response sheet)
"Behavior Theory" Reel II - Educational Psychology

____ S. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Learning Lecture II"

____ T. 16mm Film (response sheet)
"Behavior Theory" Reel III - Educational Psychology

copies needed

___ U. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Learning Lecture III"

___ V. Paperback book
"Living With Children" - Patterson - Research Press, P.O. Box 2459, Station A, Champaign, Illinois, 61820.

___ W. Article reprint
"Money, Motivation and Academic Achievement"
Green and Stachnik

___ X. Article reprint
"Contingency Contracting" - Wesley C. Beckner

___ Y. 16mm Film
"Case II"

___ Z. Slide-tape program (response sheet) (Note Outline)
(Program Produced) "Learning Lecture IV"

___ Z2. Slide-tape program (response sheet) (Note Outline)
(Program Produced)

Remedial Activities:

___ RM. Paperback book
Learning: Reinforcement Theory - Keller - Random House; New York, 95¢

___ RN. 16mm Film (response sheet)
"Behavior Theory" Reel I - Educational Psychology

___ RO. Video-tape
"Shaping" - Vargas, "Motivation" - Vargas

___ RP. 16mm Film - Educational Psychology
"Programmed Instruction"

Section II Education 106, Materials

Unit I Measurement

Part I. Descriptive Statistics

Instructional Activities:

copies needed

___ A. the mimeographed booklet Statistics and the the Interpretation of Standardized Tests
(Handouts) (Program Produced)

___ B. the programmed text Statistical Concepts
(purchase at the bookstore)

___ C. Lecture I - non mediated
"Statistics and the Classroom Teacher"

___ D. Lecture II -video-tape (40 min.) (Project Produced) "Measure of Central Tendency"

copies needed

____ E. Lecture III - video-tape (50 min.) (Project Produced) "Measure of Variability"

____ F. Criterion Test I

Part II. Interpretation of Standardized Tests

Instructional Activities:

____ A. the mimeographed booklet Standardized Tests (handout)

____ B. Film I - WVU (30 min.) "The Standardized Test"

____ C. Lecture IV - video-tape (45 min.) (Program Produced) "The Wechsler Intelligence Scale for Children"

____ D. Film II - Penn State or Indiana "Testing Intelligence with the Stanford-Binet"

____ E. Lecture V - non mediated "Standardized Tests: Uses and Abuses"

____ F. Criterion Test II

Unit II Human Growth and Development

Part I. Principles of Development

Instructional Activities:

____ A. Friedenberg. The Vanishing Adolescent, Dell Publishing Co, Inc., New York; 60¢.

____ Salsbury. The Shook-up Generation, Fawcett Publications, Inc., Greenwhch, Conn., 75¢.

____ Ginott. Between Parent and Child, Avon Books, Avon Books, New York, $1.25.

____ Axeline. Dibs, Ballantine Books, Inc. New York, 75¢.

____ Mead. Coming of Age in Samoa, Dell Publishing Co., Inc. New York, 95¢.

____ Kozol. Death At An Early Age, Bantam Books, Inc., New York, 95¢.

____ B. Film I - Indiana (50 min.) "A Time for Growing" and "Principles of Development"

____ C. Lecture I - non mediated. "Pre-Natal Influences in Development"

____ D. Film II - Indiana (25 min.) "Biography of the Unborn"

____ E. Film III - Penn State (45 min.) "Portrait of the Inner City"

copies needed

____ F. Film IV - WVU (25 min.)
"Classification"
____ G. Lecture II - video tape
"Environmental Influences in Development"

Part II. Individual Differences

Instructional Activities:

____ A. The Ridge Forest Sixth Grade in basket kit
(purchase at bookstore) (Project Produced)
____ B. Lecture III - non mediated
"Children's Needs"
____ C. Film V - WVU (50 min.)
"Keith" and "Dick"
____ D. Lecture VI - video-tape (25 min.)
"Children's Thinking Processes"
____ E. Film V - (30 min.)
"Children Without"
____ F. Lecture V - non mediated
"Special Problems of the Disadvantaged"
____ G. Film VII - WVU (50 min.)
"Greg" and "Alice"
____ H. Criterion Test III

Unit III Classroom Management

Instructional Activities

____ A. the problem in the Ridge Forest Sixth Grade in
basket kit (already purchased)
____ B. the mimeographed booklet Classroom Management
(handout) (Project Produced)
____ C. Lecture I - non mediated
"Classroom Communication"
____ D. Film I - WVU (25 min.)
"High Wall"
____ E. Lecture II - Non mediated
"Children's Behavior Problems"
____ F. Film II - Indiana (25 min.)
"Controlling Behavior Through Reinforcement"
____ G. Lecture III - non mediated
"Counselor and the Teacher"
____ H. Criterion Test IV

Unit IV Field Project

Concurrent with the students regular coursework, each Education 106 student is required to spend 2 hours per week in a field project with one of the Monongalia County Schools or various agencies in the Morgantown area.

copies needed

Instructional Activities:

___ A. to schedule himself into this project by contacting Mr. Taylor or Mrs. Minor at the Learning Center, 4th floor, New Forestry, beginning January 12 and no later than, January 16, 1970. No scheduling will be done after January 16.

___ B. The Field Project Handbook (handout)

Section III Other Materials

16 MM FILMS

___ 1. 11 Film Classroom Simulation, 15 min.
___ 2. 1 Film Classroom Simulation, 20 min.
___ 3. 1 Film Interpretative Tests, 20 min.
___ 4. 1 Film Standardized Tests, 30 min.
___ 5. 1 Film Behavior Theory, 20 min.
___ 6. 1 Film Mr. Lands 6th Grade, 15 min. each Reel 1 and 2.
___ 7. 1 Film Mr. Lands 6th Grade, 20 min.
___ 8. 1 Film Robert, 30 min.
___ 9. 1 Film Descriptive Words 4th Grade, 30 min.
___ 10. 1 Film Greg, 30 min.
___ 11. 1 Film Alice, 30 min.
___ 12. 1 Film Keith, 30 min.
___ 13. 1 Film Dick, 30 min.
___ 14. 1 Film Behavior Theory, Part I, 20 min.
___ 15. 1 Film Behavior Theory, Part II, 20 min.
___ 16. 1 Film Behavior Theory, Part III, 20 min.
___ 17. 1 Film Programmed Instruction, 15 min.
___ 18. 1 Film Piaget Classification, Print 11, 20 min.
___ 19. 1 Film Piaget Conservation, Print 29, 45 min.
___ 20. 1 Film Freddie the Frog, 20 min.
___ 21. 1 Film Case II.
___ 22. 1 Film High Wall.
___ 23. 1 Film Audio-Visual Materials in Teaching
___ 24. 1 Film The Audio-Visual Supervisor
___ 25. 1 Film Biography of the Unborn
___ 26. 1 Film Bring the World to the Classroom
___ 27. 1 Film Bulletin Boards: An Effective Teaching Device
___ 28. 1 Film The Carpet Under Every Classroom
___ 29. 1 Film Celluloid College - Basic Motion Picture Technique
___ 30. 1 Film Comparative Tests on a Human and A Chimpanzee Infant of Approximately the Same Age
___ 31. 1 Film Duplicating By the Spirit Method
___ 32. 1 Film Characteristics of A Core Program
___ 33. 1 Film Field Trip
___ 34. 1 Film Flannel Boards and How to Use Them
___ 35. 1 Film Freedom to Learn
___ 36. 1 Film Importance of Goals

copies needed

___ 37. 1 Film Innovations in Education; Part I
___ 38. 1 Film Innovations in Education; Part II. Perf. Curric. Issues in Organization
___ 39. 1 Film Innovations in Education; Part III; Differentiated Teaching Staff
___ 40. 1 Film Innovations in Education, Part IV; Resource Center
___ 41. 1 Film Innovations in Education, Part V; the Open Laboratory
___ 42. 1 Film Innovations in Education, Part VI; Small Group Instruction
___ 43. 1 Film Innovations in Education, Part VII; Large Group Instruction
___ 44. 1 Film Mimeographing Techniques
___ 45. 1 Film Motivating the Class
___ 46. 1 Film Reinforcement in Learning and Extinction
___ 47. 1 Film Television in Education
___ 48. 1 Film Television Techniques for Teachers
___ 49. 1 Film Time of Growing
___ 50. 1 Film Using the Classroom Film
___ 51. 1 Film Way of Learning: Experiment in Independent Study
___ 52. 1 Film Stepping Along with Television
___ 53. 1 Film Children Growing Up with People
___ 54. 1 Film Children Learning by Experience
___ 55. 1 Film Com. Schools Can't Stand Still
___ 56. 1 Film New Design for Education
___ 57. 1 Film Visual Perception and Failure to Learn

Recording Tapes

___ 1. Sound of Learning
___ 2. Developing Institutions Project - Visual.
___ 3. Simulation 105 Beginning with no.3.
___ 4. The Simulation of Early Cognitive Learning.
___ 5. Dreikurs, Rudolf - The Underachiever and Understanding the Difficult Child. (2 tapes)
___ 6. Discipline, Problems of Adolescence, Heredity and Environment.
___ 7. Intelligence and Development, Interests and Social Development, Delinquency and Adjustment.
___ 8. Mr. Land's Class - 106.
___ 9. Harry Scott - Motivation and Taxonomy. (2 tapes)
___ 10. Learning Lecture V - Motivation
___ 11. Educational Psychology
___ 12. TIII Heredity and Environment.
___ 13. TII8 Using the Peer Group.
___ 14. TI36 Teaching and Learning Machines.
___ 15. TI47 Different Cultural Backgrounds.
___ 16. TI52 Social Classes.
___ 17. TI68 Readiness in Pre-School
___ 18. TI72 Emotional Needs of Children.
___ 19. TI75 Parent Child Relationships
___ 20. T23I Assessment of Learning.

copies needed

____ 21. T282 Peer Culture
____ 22. Situation III, Training Tape III.
____ 23. Situation IV, Training Tape IV.
____ 24. Studying Teacher Influence, Part IV.
____ 25. Teacher Influence I
____ 26. Teacher Influence II
____ 27. Teacher Influence III
____ 28. Teacher Influence IV
____ 29. Teacher Influence V
____ 30. Adjusting a Television Receiver.
____ 31. Listening: A Programmed Approach
____ 32. Behavioral Objectives, Tape III, and Tape I.
____ 33. Use of the Tape Recorders.
____ 34. Filmstrip I, Tape
____ 35. Situation I. Training Tape I.
____ 36. Situations III and IV, Training Tapes 3 and 4.
____ 37. Situation II, Training Tape II.
____ 38. Situation IV, Training Tapes 3 and 4.
____ 39. Filmstrip III, Behavioral Objectives
____ 40. Buhler - Clinical and Developmental Aspects of Child Psychology.
____ 41. McKeachie - Motives and Learning.
____ 42. Gessell and Child Development and a Science of Man
____ 43. Vargas - General Discrimination Lecture III.
____ 44. Vargas - Learning Lecture II.
____ 45. Oklahoma Christian College.
____ 46. Oklahoma Christian College.
____ 47. Interaction Analysis, Sessions 3 and 4.
____ 48. Situation I, Training Tape I.
____ 49. Learning Lecture IV.
____ 50. Learning Lecture I.
____ 51. Interaction Analysis Training Kit I.
____ 52. Interaction Analysis, Level I.
____ 53. Hochins - Interaction Analysis.
____ 54. Interaction Analysis.
____ 55. Interaction Analysis Conference Introduction.
____ 56. Interaction Analysis Conference 3.
____ 57. Interaction Analysis Conference 4.
____ 58. Coordinators
____ 59. Unit I of Measurement.
____ 60. Measurement Lecture on Teacher-made Tests.
____ 61. Measurement - Writing Objective Test Items.
____ 62. Measurement - Unit II.
____ 63. Measurement Lab - Writing Objective Test Items 2.
____ 64. Measurement II, Writing Objective Test Items.
____ 65. Measurement Lab - Lecture on Teacher-made tests 3.
____ 66. 105 Sensitivity Groups, Section 1 and 4.
____ 67. 105 Sensitivity Group, Section 7.
____ 68. Case II, Copy I.
____ 69. 105 Sensitivity Group, Sections 1 and 9.

copies needed

____ 70. 105 Sensitivity Group, Sections 7 and 17.
____ 71. Klausmier - Transfer of Training.
____ 72. Walls Interview of 5 children, 106.
____ 73. Dr. Dwight Allen, Tape III.
____ 74. Dr. Dwight Allen, Tape II.
____ 75. Dr. Dwight Allen, Tape IV.
____ 76. Dr. Dwight Allen, Tape I.
____ 77. Non-Verbal Behavior.
____ 78. Bill I.
____ 79. Bill II.
____ 80. 3 subjects - April 28.
____ 81. Neg. B and C.

Carousel Slide Trays

____ 1. Measurement Unit I, Carousel I.
____ 2. Measurement Unit I, Carousel II.
____ 3. Ed. 106, Measurement Unit I.
____ 4. Measurement
____ 5. The College and Leopard OCC.
____ 6. OCC Slides, Copy e.
____ 7. OCC Program Slides and tape.
____ 8. Simulation Orientation Slides.
____ 9. Vargas - Learning Lecture I.
____ 10. Vargas - Learning Lecture I, Slide and Tape
____ 11. Programmed Learning "Teaching Machines"
____ 12. Developing Institutions.
____ 13. Learning Simulation - Slides, Tape and Film.
____ 14. "Branching Programs"

Slide Tapes

____ 1. "Nikkormat Training Program"
____ 2. "To 101 System"
____ 3. "The Classroom Instructional System
____ "Duluth Central High School Today"
____ "Project Criterion"

Video Tapes 1" Ampex

____ 1. 3M Transparency Demonstration
____ 2. 221 Lecture
____ 0-275 Organization of Mediated Lesson
____ 280-581 WVU - Old MountainLair
____ 582-790 Choosing a Specific Medium
____ 3. 221 Lecture
____ 0-200 Choosing a Specific Medium
____ 206-335 Evaluation of a Teacher' Role
____ 478-614 The Classroom Instructional System
____ 620-710 Introduction to Thermofax Transparency Materials
____ 4. Math Demonstration at Second Ward

copies needed

___ 5. The Administration of the W.I.S.C.
___ 6. Math Demonstration at Second Ward - Jr. Smith
___ 7. Math Demonstration at Second Ward - Jr. Smith
___ 8. Math Demonstration at Second Ward - Jr. Smith
___ 9. Interaction Analysis, Edmund Armidon, 6/10/68
___ 10. AACTE - Non Verbal Behavior, 7/9/68
___ 11. Simulation, Don Cruickshank, 6/11/68
___ 12. Microteaching, Dwight Allen, 6/1168
___ 13. Microteaching
    0-6-- Blank
    600-1000 General Use
___ 14. Microteaching Demonstration
___ 15. Cheat Lake Schools Grades 3 and 4
___ 16. Piaget Demonstration, Dr. R.T. Walls, 1/7/70
___ 17. Learning Lecture III, Vargas
___ 18. Microteaching Demonstration
___ 19. Dr. Patterson - Statistical Program for 106 (Bad Tape)
___ 20. Headstart
___ 21. Headstart
___ 22. Dr. Iaonne Practice Tape
___ 23. Motivation and Discipline, Vargas
___ 24. Learning Lecture II - Shaping, Vargas
___ 25. Motivation and Discipline, Vargas
___ 26. Learning Lecture II, Reinforcement, Vargas
___ 27. Bycknell University Continuous Progress Program
___ 28. Demonstration Tape
___ 0-215 Making Stencils
___ 216-355 Dittos
___ 535-640 Making Paper Letters
___ 518-781 Choosing a Specific Medium

Vimcet Filmstrip and Manuals

___ 1. "Systematic Instructional Decision-Making"
___ 2. "Educational Objectives"
___ 3. "Selecting Appropriate Educational Objectives"
___ 4. "Behavioral Objectives"
___ 5. "Establishing Performance Standards"
___ 6. "Evaluation"
___ 7. "Modern Measurement Methods"
___ 8. "Defining Content for Objectives"
___ 9. "Appropriate Practice"
___ 10. "Perceived Purpose"
___ 11. "Discipline in the Classroom"
___ 12. "Experimental Designs for School Research"
___ 13. "Identifying Affective Objectives"
___ 14. "Instructional Supervision"
___ 15. "Curriculum Rationale"
___ 16. "Measurement of Learning"
___ 17. "Studying Teacher Influence"
___ 18. "Teaching Machines"
___ 19. "How to Read a Resistor"

copies needed

Additional Film Series

___ 1. "Critical Moments in Teaching"
___ 2. "Teaching Skills for Secondary School Teachers."
___ 3. "Mini Course Effective Questioning Elementary Level."

Critical Moments in Teaching Films

___ 1. Welcome to the Third Grade
___ 2. The Poetry in Paul
___ 3. The Day the Insects Took Over
___ 4. Just A Simple Misunderstanding
___ 5. Some Courses Don't Count
___ 6. Give Me Instead A Catastrophe
___ 7. A Child Who Cheats
___ 8. The First and Fundamental R
___ 9. I Walk Away in the Rain
___ 10. Image in a Mirror
___ 11. Julia
___ 12. Tense: Imperfect
___ 13. Report Card
___ 14. Less Far Than the Arrow
___ 15. What Do I Know about Benny?

Teaching Skills from General Learning Skills

Cluster I Response Repertoire

___	1.	*Verbal Responses	1-1 Elem. and Sec.
___	2.	*Non-Verbal Responses	1-2 Elem. and Sec.
___	3.	*Verbal and Non-Verbal Responses	1-3 Elem. and Sec.

Cluster II Questioning Skills

___	4.	*Fluency in Asking Questions	2-1 Secondary
___	5.	Probing Questions	2-2 Secondary
___	6.	*Higher Order Questions	2-3 Secondary
___	7.	Divergent Questions	2-4 Secondary

Cluster III Increasing Student Participation

___	8.	Reinforcement	3-1 Secondary
___	9.	Recognizing Attending Behavior	3-2 Secondary
___	10.	Silence and Non-Verbal Cues	3-3 Secondary
___	11.	Cueing	3-4 Secondary

Cluster IV

*These are the films that we have received.

copies needed

Cluster V Presentation Skills

___	12.	*Lecturing	5-1	Secondary
___	13.	*Use of Examples	5-2	Secondary
___	14.	*Planning Repetition	5-3	Secondary
___	15.	*Completeness of Communication	5-4	Secondary

* These are the films that we have received.

Mini Course - 16MM - Film

___ 1. Introduction
___ 2. Instructional Practice Lesson
___ 3. Practice Lesson Model A - Model B
___ 4. Instructional Lesson I
___ 5. Lesson I Model A - Model B
___ 6. Instructional Lesson 2
___ 7. Lesson 2 Model A - Model B
___ 8. Instructional Lesson 3
___ 9. Lesson 3 Model A - Model B
___ 10. Instructional Lesson 4
___ 11. Lesson 4 Model A - Model B

The Elementary Science Lab

Equipment Self-Instructional Units

___ 1. Thermofax Secretary
___ 2. Dry Mounting and You
___ 3. What and How of Dry Mounting
___ 4. Kodak Carousel 850
___ 5. Bell and Howell Automatic Filmstrip Projector
___ 6. Sony 230
___ 7. Bell and Howell Autoload Projector

III. INSTITUTIONAL IMPLEMENTATION OF MATERIALS

The flexible approach used in the development of both content and instructional design has allowed institutional representatives to implement content and design according to institutional needs. The results of this implementation vary across institutions from the application of the design as one part of a systems approach in the relationship between instructor and learner to the application of the model in a self-instructional learning mode.

Implementation Across Institutions

Sixty-five per cent of the total faculty in the division of education across institutions used project produced materials while an additional twelve per cent of the faculties utilized project purchased materials. Ninety-eight per cent of the total faculties across institutions felt that project affiliation originated special input for the courses that they were presently teaching.

The mode of presentation across institutions most frequently used is represented in the following analysis:

51% of the faculties used a group mode of presentation;

19% used both group and individual modes in supplementing instruction

17% used an individual mode of presentation as primary content; and

15% used the content in both individual and group remedial loops.

Across institutions the reaction of the combined faculties who had access to or previewed the materials was as follows:

73% of the combined faculties who previewed materials rated the materials as good;

23% rated the materials as average; and

4% of the combined faculties rated the materials as poor.

Implementation at Fairmont State College

Fairmont State College set as project objectives the general upgrading of instruction, content, and faculty skills. Involvement in the project meant the development of content design, the development of instructional models, and the design of large scale workshops that involved Fairmont's total faculty.

The implementation of project produced content design and technological skills at Fairmont is college wide. The content is being used by sixty per cent of the Division of Education and has been introduced in other divisions of the college as well.

The primary instructional mode implemented at Fairmont College consists of the basic content design developed cooperatively by the project membership applied in a group mode instructional approach. In addition, pilot studies were conducted in an individualized self-instruct mode of presentation. Some use was also made of remedial loops using project content.

During the pilot study phase of the Developing Institutions Project, 60% of the faculty of the Division of Education at Fairmont State College were using project produced materials while 72% of the department's faculty felt that project affiliation originated special input for the course they were presently teaching. The inputs most often mentioned were the following:

1. writing and using behavioral objectives;
2. criterion evaluation rather than norm evaluation;
3. introduction to and use of video tape recording;
4. use of project produced materials;
5. introduction to and use of microteaching and percision teaching;
6. becoming aware of and increased attention to individual differences;
7. construction of syllabuses for courses;
8. increased familiarity with current educational hardware and softwear;
9. increased communication and articulation between faculty and coursework;
10. increased positive attitudes of students toward school and content when using updated mediated content.

Across the department, every program handout or video tape produced by the project was used in a variety of instructional modes. The group mode of presentation was emphasized although individual, remedial, and supplementary modes were introduced in the use of these materials. The following techniques of usage were reported by faculty members:

1. VTR public school experience and then evaluate lesson in class;
2. use simulation with "In Basket and Critical Moments" film;
3. mediated content as supplement or remedial tracts;
4. to enrich and develop some degree of commonality in student background.

The materials were evaluated by the instructors with the following comments:

1. the materials helped instructors to accomplish objectives;
2. materials were very useful in helping students to successfully negotiate the student teaching experience;
3. where materials were used, differences in achievement were noted by the majority of department faculty;
4. eighty-five per cent of the faculty rated the materials from good to excellent.

Since the project has been initiated, faculty have noticed the following instructional changes in the college:

Movements toward:

a. use of objectives in instruction

b. use of mediated content on an individual basis

c. an increased use of technology in the classroom

d. use of self-instruction

e. use of hand-outs

The above trends were identified as needing additional change and the forty per cent of the faculty who identified these trends were anxious to continue to work after the project is terminated.

Implementation at Shepherd College

Shepherd College set as a project priority the upgrading of instruction through the incorporation of audio-visual technology and mediated content into the undergraduate teacher education program.

The content design model was cooperatively developed by Shepherd project membership and implemented in a group presentation mode and used primarily as supplementary content. In addition, a pilot study was conducted in a group self-instructional mode. Shepherd is presently working toward a greater emphasis of a performance curriculum in the teacher education program. The Video-Tape-Recorder and other selected autio visual equipment purchased with project funds have given Shepherd the feedback capability that is generally making possible the increase of individualized instruction and specifically making possible the movement towards a performance curriculum.

During the pilot study phase of the Developing Institutions Project, twenty-four per cent of the faculty of the Division of Education used project produced materials, fifty per cent of the faculty of the Division used project related materials and sixty per cent of the faculty of the Division felt that the project had direct input into the courses they are presently teaching.

The inputs most often mentioned were the following:

1. use of mediated materials and handouts;
2. introduction to and use of Video-Tape-Recording;
3. increased familiarity with and use of simulation
4. formation of and use of learning center;
5. increased flexibility of modes of instruction.

Across the department the SRA Teaching Problems Lab and Critical Moments in Teaching films were used by twenty-six per cent of the faculty during the pilot phase in addition to twenty-four per cent of the faculty using slide-tape programs and project produced handouts during this same pilot study period. An additional ten per cent of the faculty used techniques of instruction learned through project affiliation.

The following techniques were frequently mentioned:

1. use of VTR for self-evaluation of student teaching;
2. instructor self-appraisal with use of VTR;
3. the use of teacher objectives in the classroom
4. use of micro-teaching.

The following comments were made by instructors and students concerning evaluation:

1. Eighty per cent of the instructors evaluated the materials from good to excellent;
2. the majority of students evaluated the materials from favorable to good.

Since the initiation of the project, the following trends have been noticed by the faculty at Shepherd:

1. a greater use of discussion groups, committee work and student presentations;
2. a greater use of self-instruction;
3. a greater use of supplementary reading;
4. a general movement toward a performance curriculum.

Forty per cent of the faculty that identified these curriculum trends were anxious for work to continue in these areas after the product is terminated.

Implementation at West Virginia State College

In 1967 the Department of Education did not have an agreed upon philosophy for the program in teacher education. As a result of the Project, WVSC's teacher education program now has a systematic model for teacher education.

The descriptive model is an outgrowth of the basic performance design developed during the summer of 1967. The WVSC's model is based on the following four components:

1. two taxonomies of educational objectives;
2. the Gestalt concept of successive spproximation; and
3. an operant conditioning behavioral paradigm.

The basic philosophy is that of a process training model with considerable room for change in substantiate content as the years pass. A one page summarization of the model is enclosed with the analysis. It is entitled "Levels of Involvement; A Descriptive Theory Model for Teacher Education".

Project produced and purchased materials are being used along with other materials in the implementation of this model in teacher education programs.

INSERT III

SEVEN LEVELS OF INVOLVEMENT

I. RECEPTION-COMPREHENSION LEVEL
Typical Classroom and Classroom-Related Activities
  lecture
  reading
  discussion
  previewing

II. EXTRAPOLATION LEVEL
Low Level Applications of Classroom Materials
  protocol materials (e. g. classroom interaction sequences with an interaction analysis system)
  other training materials (e. g. "Critical Moments" films from Indiana University)
  observations in classrooms (e. g. coding classroom interaction, analysis of teacher's reinforcement structure, analysis of teacher's planning skills)
  written problems (e. g. books of teaching problems)

III. CONTRIVED SETTINGS
High Level Application of Classroom Material in Approximations to Real Settings
  role playing
  simulation
  simulation games

IV. REAL SETTINGS: STRICTLY CONTROLLED*
College Student Engaged in Real Teaching Activities of Highly Structured Nature or Diminished Size
  micro-teaching
  tutoring
  student aide work: teaching a single lesson
  student aide work: teaching a series of controlled lessons
  student aide work: working with one student or small group

V. REAL SETTINGS: PARTIALLY CONTROLLED
College Student Engaged as Teacher in Full Classroom Setting with Designated Supervisor(s) Normally Present
  traditional student teaching activity
  practice teaching activity

VI. REAL SETTINGS: LOOSELY CONTROLLED
College Students Engaged as Paid Teacher with Designated Supervisor Not Normally Present
  internship
  internship with team teaching

VII. REAL SETTINGS: AUTONOMOUS
Former College Student Engaged as Paid Teacher with Ultimate Responsibility for Classroom
  fulltime teacher: self-contained classroom
  fulltime teacher: team teaching situation

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* These situations can be at peer level or at superior--subordinate level, as long as they are real and not role playing activities.

During the pilot study phase of the Developing Institutions Project one hundred per cent of the faculty of the Division of Education at West Virginia State were using project produced materials while one hundred per cent of the Department faculty felt that project affiliation originated special input for the courses that they were presently teaching. The general inputs most often mentioned were the following:

1. writing and using behavioral objectives;
2. use of media and student active involvement sheets;
3. more emphasis on student performance that is non-related to pencil and paper tests;
4. a general reshaping of course designs from one of a traditional approach to one of a balanced presentation of modes, lab experiences, and field experiences;
5. general individual staff development of special competencies and diverse experiences as a result of project experiences;
6. a general motion of mediating content and individualizing instruction;
7. increased familiarity with current educational hardware and software;
8. use of project produced materials;
9. introduction to and use of VTR;
10. use of project purchased materials.

Across the department selected content was used in a variety of instructional modes. The content was presented for the most part in a group mode with secondary emphasis being given to individual, remedial and supplementary modes.

The implementation techniques used in this institution were reported as follows:

1. content was used as an alternate mode of instruction;
2. "Critical Moments in Teaching" were used for simulation purposes;
3. content was used as supplements, remedial loops, and as primary content for instructional purposes;
4. students used materials and methodology to present micro-teaching lessons;
5. VTR micro-teach and evaluate in class;
6. situations depicted in the slide-tapes and films furnished models for role playing.

Seventy-five per cent of the faculty who used these materials rated the content as good while twenty-five per cent of the faculty rated the content as average. In addition, all faculty evaluated the content as successful from the standpoint of meeting objectives and student satisfaction.

The student reaction depended upon the content being used. For the most part, student reactions were favorable with the majority of students liking the approach and frequently commenting that classes were more interesting when various modes of instruction were used.

Since the project's initiation in 1967, the following curriculum changes have been noticed:

1. an increased use of individualized instruction and discussion groups;
2. increased student activity;
3. use of mediated content as an instructional approach;
4. greater student use of slide-tape and tape recording machines;
5. a greater use of handouts and supplementary readings.

Fifty per cent of the faculty who identified these changes, indicated a willingness to continue to work for additional curriculum change in these areas.

Implementation at West Virginia University

The institutional model implemented at West Virginia University is an individualized self-instructional performance curriculum. The model, as operationalized, is represented in figure 3.

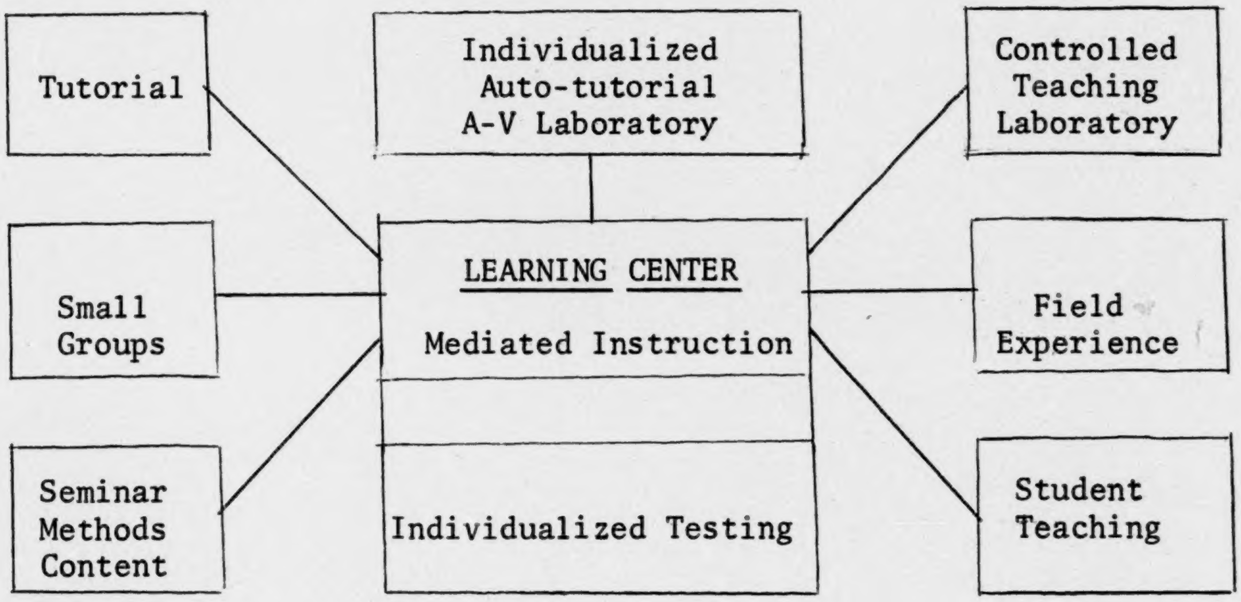


Figure 3. Operational Model for a Performance Curriculum in Teacher Education.

Auto-tutorial A-V Laboratory All students have an early experience in the auto-tutorial A-V Laboratory. The function of this lab is to provide students with the skills for operating six to ten instructional machines.

The laboratory consists of a series of individual stations each with a basic machine. Each station is supplied with programmed materials to assist with the instructional phase of the operation. Students move through programmed material to the actual operation of equipment. In each case, performance criteria are specified. Students are checked out as they reach proficiency in operation of the machine. A student must have reached performance level and be certified to operate the machine before he can receive instruction through mediated programs in the Learning Center.

Learning Center-An Instructional Laboratory. The content from the basic foundation courses has been organized into instructional units and mediated for presentation in the Learning Center. Mediation has been accomplished by using audio and video tape, filmstrips, slides, and films. Instructional units include performance objectives, a pre-test, recommended instructional activities and post-test written over the objectives for the unit. Mediated presentations are accompanied by student response sheets and a short check-out quiz. After completing a series of instructional activities, the student may request a criterion test. A performance of ninety per cent is required on the criterion test for a grade of "A". A student falling below this level of performance has the option of taking the lower grade or retaking the test after he has completed a remedial loop in the instructional sequence.

The Learning Center provides considerable opportunity for individualizing instruction if individualization is taken to mean that one receives appropriate material at a time when he is ready for it. One may go through this instructional design at his own rate of speed.

Controlled Teaching Laboratory. The function of the controlled teaching laboratory is to permit students to bring each concept learned to a performance level. Each unit of instruction presented in the Learning Laboratory is accompanied with a task to be performed in the teaching laboratory. As the student is ready to teach, he schedules time in the laboratory situation with a learning team consisting of five classmates. The teaching session is video-taped and critiqued according to specified criteria. If the student's performance does not reach criterion level, he may, after practice, repeat the performance.

Field Experience. Field experience is started after a student has completed three basic units of instruction or one semester of course work. The field experience may take the form of teacher aide activities, assisting in a tutorial program, or instructing in other educational settings. This experience is related to further instructional material presented in the Learning Center.

Tutorial and Small Group Seminars. Tutorials or small group seminars are used in a flexible manner throughout the entire program. These experiences usually begin as tutorials with instruction in the Learning Center then becoming discussion groups or teaching teams in later phases of the program. Seminars related to methods and subject matter areas accompany student teaching.

The content design model implemented at WVU is the same design developed in the cooperative project. The first experimental course, Education 105, is divided into four major units each of which is divided into small sequential steps programmed for self-instruction. Each unit contains three performance tasks: a paper-pencil test, a written assignment, and a micro-teaching lesson.

Each of the performance tasks is discussed briefly below:

1. Paper-Pencil Tests. There are three types of paper-pencil tests that the student will encounter in the course:

a. Pre-test - Before beginning a unit of instruction, each student must take a Pre-test. The Pre-test assesses your current skills prior to instruction and determines the instructional activities you must complete.

b. Post-test - In order to assess your skills after instruction Post-tests are given on an individual basis. Each student must score ninety per cent or higher on the test.

c. Re-test - If a student scores less than ninety per cent on a Post-test, he must complete the suggested remedial activities and retake the Post-test until he scores ninety per cent or higher.

2. Written Assignments. After completing a series of instructional activities, the student will write an assignment following the criteria specified and turn in the assignment at the MCS (materials check out station). The assignment will be evaluated on the criteria specified by a graduate instructor. A performance level of "A" or "C" must be reached before going on to the next objective.

3. Micro-teaching. Given a laboratory setting, equipped with a video-tape recorder (VTR), the student will be required to tape a micro-teach for each unit for instruction following specified criteria.

In order to meet the above objective, the student must first learn to operate the VTR by going through the self-instructional program at the MCS. In conjunction with being authorized to operate the VTR, video-tape recorder, the student must sign up for a "Teaching Team" at the first regularly scheduled class meeting.

A minimum of five students constitutes a "Teaching Team". Once established, these teams are permanent and meet throughout the semester whenever any one team member is ready to give a micro-teach. Team members contact each other and make plans to meet regularly each week in order to complete all micro-teaching assignments.

CHAPTER IV

INSTITUTIONAL CHANGES DURING PROJECT'S TENURE

Systematic exposure by Developing Institutions faculty to a series of conferences, workshops, consultants, trips to innovative programs, and general sharing of ideas have led to two kinds of general course changes implemented by project affiliation across institutions. One kind of change is the result of the direct implementation of project developed approaches and materials into a course and/or course sequence and the second kind of change is the operationalization of individual instructional techniques gleaned from project affiliated experiences by project membership.

The analysis will not differentiate between the contribution made by the kinds of changes; it will only identify the curriculum changes across institutions and between institutions that have resulted directly or indirectly from project affiliation. The following content will identify four such changes:

1. curriculum trends
2. departmental changes
3. course changes
4. additional changes

I CURRICULUM TRENDS AS A RESULT OF PROJECT AFFILIATION

At this point in time, each institution has implemented the open ended instructional design and content design which were project developed. The instructional design was ameliorated according to institutional need and the content design was implemented as conceptualized in earlier workshops. Therefore, the instructional change that has resulted from project affiliation is not the result of massive acceptance of any one instructional approach, but rather as a result of institutional faculties applying designs where appropriate and operationalizing strategies and techniques, gleaned from project affiliated experiences.

Consequently, the implementation research question, "Does this technique work in my classroom?" has resulted in many individual pilot studies at each institution and is, and will continue to be a primary vehicle for institutional change.

General Curriculum Changes Across Institutions

The analytic method used in the identification of curriculum change at each institution and across institutions was a questionnaire administered to faculty members in the Division of Education at each developing institution in 1971. The results of the questionnaire are listed in Table 1.

In summary fashion, the results are as follows:

1. Scheduling: Sixty per cent of the combined faculties across institutions have identified a trend in the kind of scheduling occurring in Developing Institutions as a result of project affiliation. There has been a general increase in individualized instruction and small section meetings and a decrease in the use of large lecture approaches.

2. Student time in activities: Forty-five per cent of the combined faculties have identified an increase in the amount of time allocated by instructors during class for student demonstration of competencies. For example, student manipulation of audio-visual aids, student presentations, and student committee

work have all increased. In addition, increasing use is being made of films as simulation devices for student involvement.

3. Use of mediated content: One out of every two faculty members identified the increased use of teacher produced mediated content in both individual and group modes as a definite curriculum trend.

4. Time in different modes of instruction: The time in both individual and group modes of mediated instruction has increased during the project's tenure. In addition, the use of instructional techniques during the group mode of instruction has been changed dramatically. The difference is so great that a group mode of instruction is seen as differing from a traditional group mode of presentation in the developing institutions as a result of the project.

5. Time in different content modes: Curriculum trends in the presentation of content have been detected by forty-three per cent of the faculty across institutions. The use of the tape recorder and the slide-tape method of presentation has increased dramatically in all project institutions.

6. Use of self-instruction: A trend toward self-instruction has been detected by one out of every three faculty members across institutions. Across institutions, self-instruction had been used for remedial purposes and at least in one pilot study at each institution, self-instruction has been implemented as a primary instructional technique.

7. Use of remedial activities: Twenty-two per cent of the faculties have identified remedial activities as a curriculum trend. The project produced slide-tape programs have been responsible for this small increase in remedial loops in instructional sequences.

8. Use of objectives: One out of every three faculty members involved in the various departments acknowledged the increase of behavioral objectives in the instructional sequence across institutions. These objectives are now stated in terms of observable behaviors and include criterion levels of achievement.

TABLE 1

CHANGES	INCREASE	NO CHANGES	NEED FOR CONTINUED CHANGES		WILL CONTINUE TO WORK IN THESE AREAS	
			YES	NO	YES	NO
KINDS OF SCHEDULING	60%	0%	40%	6%	43%	9%
STUDENT TIME IN ACTIVITIES	55%	12%	46%	6%	43%	9%
USE OF MEDIATED CONTENT	40%	12%	37%	3%	28%	0%
STUDENT TIME IN DIFFERENT MODES OF INSTRUCTION (INDIVIDUAL & GROUP)	34%	6%	25%	0%	10%	0%
TIME IN DIFFERENT CONTENT MODES	43%	15%	16%	9%	20%	3%
USE OF SELF-INSTRUCTION	40%	9%	37%		40%	
USE OF REMEDIAL ACTIVITIES	22%	15%	28%		20%	
USE OF OBJECTIVES	37%	9%	28%		19%	6%
USE OF PRE-TEST	19%	21%	28%		22%	3%
KIND OF ASSIGNMENTS	48%	36%	39%	15%	24%	12%

Table 1. Department curricular changes across institutions measured in per cent of faculty in all institutions that have identified curriculum changes.

General Curriculum Changes By Institution

Tables II, III, IV and V represent curriculum changes by institutions. These tables represent the percentage of faculty members in each institutional department that have had some exposure to the project and have identified curriculum changes at their respective institutions. In addition, data is included that indicates a willingness to continue working in the areas that have been identified as curriculum trends in an effort to maintain and/or increase the impetus contributed by the federal project at the institutional level.

Each institution has identified a priority of objectives to be achieved as a result of project association. These objectives differ at each institution; therefore, the curriculum trends will vary according to the objectives identified by the institution. An important factor is the commitment by these faculties to continue working after the project is terminated to achieve a higher level of instructional efficiency. Generally speaking, one out of four faculty members has made this commitment.

CURRICULUM CHANGES

INSTITUTION A

TABLE II

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
IN KINDS OF SCHEDULING					
1. Large Lecture					
2. Small Section					
3. Individualized Instruction	34%				
4. Discussion Groups	69%			52%	
CONCERNING TIME IN ACTIVITIES					
1. Committee Work	69%	30%		69%	
2. Student Presentations	56%			56%	
3. Viewing Films	86%			69%	
4. Viewing TV		34%			
5. Other Audio-Visual Aids	69%			52%	
USE OF MEDIATED CONTENT					
1. Supplementary	52%			32%	
2. Remedial					
3. Group	52%				
4. Individual	52%				
CONCERNING TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Individual	34%				
2. Group	34%			52%	
TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Written					
2. Slide-tape	52%				
3. Lecture				32%	
4. Tape Recorder	69%			52%	

CURRICULUM CHANGES

INSTITUTION A

TABLE II CONTINUED

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
USE OF SELF-INSTRUCTION	69%			69%	
USE OF REMEDIAL ACTIVITIES	34%			34%	
USE OF OBJECTIVES	34%				
USE OF PRE-TEST	34%			34%	
KINDS OF ASSIGNMENTS					
1. Supplementary Reading	69%				
2. Articles Handed Out	34%			52%	
3. Written Exercises	34%				
4. Required Written Papers		52%			

Table II. Percentage of faculty members that have identified curriculum changes in Institution A.

CURRICULUM CHANGES

INSTITUTION B

TABLE III

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN YES	NO
IN KINDS OF SCHEDULING					
1. Large Lecture		30%	8%	29%	
2. Small Section					
3. Individualized Instruction	16%	29%		32%	
4. Discussion Groups	34%				
CONCERNING TIME IN ACTIVITIES					
1. Committee Work					
2. Student Presentations	24%			24%	
3. Viewing Films	24%			24%	
4. Viewing TV			8%	24%	
5. Other Audio-Visual Aids	24%			24%	
USE OF MEDIATED CONTENT					
1. Supplementary					
2. Remedial					
3. Group	24%				
4. Individual	32%				
CONCERNING TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Individual				24%	
2. Group				29%	
TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Written					
2. Slide-tape	24%		8%		
3. Lecture					
4. Tape Recorder					

CURRICULUM CHANGES

INSTITUTION B

TABLE III CONTINUED

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
USE OF SELF-INSTRUCTION	24%				
USE OF REMEDIAL ACTIVITIES				32%	
USE OF OBJECTIVES	32%	32%		29%	
USE OF PRE-TEST				29%	
KINDS OF ASSIGNMENTS					
1. Supplementary Reading					
2. Articles Handed Out					
3. Written Exercises					
4. Required Written Papers					

Table III. Percentage of faculty members that have identified curriculum changes in Institution B.

CURRICULUM CHANGES

INSTITUTION C

TABLE IV

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
IN KINDS OF SCHEDULING					
1. Large Lecture					
2. Small Section			30%		
3. Individualized Instruction	20%			20%	
4. Discussion Groups	50%				30%
CONCERNING TIME IN ACTIVITIES					
1. Committee Work	20%				
2. Student Presentations	60%				
3. Viewing Films		30%			30%
4. Viewing TV					
5. Other Audio-Visual Aids	40%				
USE OF MEDIATED CONTENT					
1. Supplementary	30%				
2. Remedial					
3. Group					
4. Individual					
CONCERNING TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Individual	20%				
2. Group	30%				
TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Written					
2. Slide-tape					
3. Lecture					
4. Tape Recorder					

CURRICULUM CHANGES

INSTITUTION C

TABLE IV CONTINUED

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
USE OF SELF-INSTRUCTION	40%				
USE OF REMEDIAL ACTIVITIES		30%		20%	
USE OF OBJECTIVES	30%	30%			
USE OF PRE-TEST					
KINDS OF ASSIGNMENTS					
1. Supplementary Reading					
2. Articles Handed Out					
3. Written Exercises					
4. Required Written Papers					

Table IV. Percentage of faculty members that have identified curriculum changes in Institution C.

CURRICULUM CHANGES

INSTITUTION D

TABLE V

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
IN KINDS OF SCHEDULING					
1. Large Lecture			100%		
2. Small Section	100%			100%	
3. Individualized Instruction	50%			100%	
4. Discussion Groups	100%				
CONCERNING TIME IN ACTIVITIES					
1. Committee Work					
2. Student Presentations	100%			50%	
3. Viewing Films				50%	
4. Viewing TV				50%	
5. Other Audio-Visual Aids	100%			50%	
USE OF MEDIATED CONTNET					
1. Supplementary	100%			50%	
2. Remedial	100%			50%	
3. Group	100%				
4. Individual	100%			50%	
CONCERNING TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Individual	100%				
2. Group	50%		50%		
TIME IN DIFFERENT MODES OF INSTRUCTION					
1. Written					
2. Slide-tape	100%		100%		
3. Lecture					
4. Tape Recorder					

CURRICULUM CHANGES

INSTITUTION D

TABLE V CONTINUED

CHANGES	INCREASED	NO CHANGE	DECREASED	WHAT AREAS WILL CONTINUE TO WORK IN	
				YES	NO
USE OF SELF-INSTRUCTION	100%			50%	
USE OF REMEDIAL ACTIVITIES	100%			50%	
USE OF OBJECTIVES				50%	
USE OF PRE-TEST					
KINDS OF ASSIGNMENTS					
1. Supplementary Reading	100%			50%	
2. Articles Handed Out	100%			50%	
3. Written Exercises					
4. Required Written Papers	50%			50%	

Table V. Percentage of faculty members that have identified curriculum changes in Institution D.

II. DEPARTMENTAL CHANGES

In the spring of 1971, an open ended series of seven questions was administered to institutional coordinators at each participating institution. The questions were as follows:

What were the curriculum changes at the departmental, divisional or college level in:

1. changes in basic philosophy;
2. changes in course sequencing;
3. changes in the use of facilities or in the design of new facilities;
4. changes in the emphasis of mode of instruction;
5. the addition of new content areas;
6. the addition of new positions; and
7. other comments.

The organizational purpose of this section is to present input from each institutional coordinator in an effort to give the reader a cross sectional exposure to different institutional points of view concerning the Developing Institutions Project. The Institutional Curriculum Change Questionnaire will be first presented in summary fashion for across institutional changes. Part II will consist of the institutional questionnaire by institution.

Across Institutional Changes.

A basic philosophic trend toward a more systematic instructional model for teacher education programs has occurred across institutions as a result of project affiliation. A Project output has been at the very least, the implementation of a descriptive model in the instructional programs.

A second decided departmental change that has been identified was the inclusion of learning centers as part of systems approach in undergraduate teacher education programs. Every institution has operationalized a learning center and staffed the centers with competent well trained technologists. These centers may be attributed either directly or indirectly to the Developing Institutions Project.

Another across institutional change has been the emphasis now given to a variety of instructional media and modes of instruction in presenting content across institutional classrooms. Departments have recognized the importance of precision teaching, micro-teaching, and the mediation of content as a result of project affiliation.

A fourth departmental change has been the addition of personnel to the Instructional Resources Center. The additions range from a Director of Education Media to technologists that maintain the resources of the learning centers.

A fifth departmental change has been the general upgrading of institutional faculty as a result of the Project. In addition to the various workshops and exposure to consultants, the following faculty members received advanced degrees and/or completed advanced courses as a result of the Program:

1. Dr. James Amos
2. Dr. Robert Hale
3. Dr. Joanenell McNealy
4. Dr. Isiah Owen
5. Dr. Jerry M. Smith
6. Mr. Maurice Kalin
7. Mr. Bill Phillips
8. Mr. James Priester

Within Institutional Changes.

The following content represents different institutional points of view concerning the Developing Institutions Project. Presented here are the comments of institutional coordinators concerning departmental changes that may be attributed to project affiliation.

FAIRMONT STATE COLLEGE:

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

BY

PROJECT COORDINATOR

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

1. Changes in basic philosophy

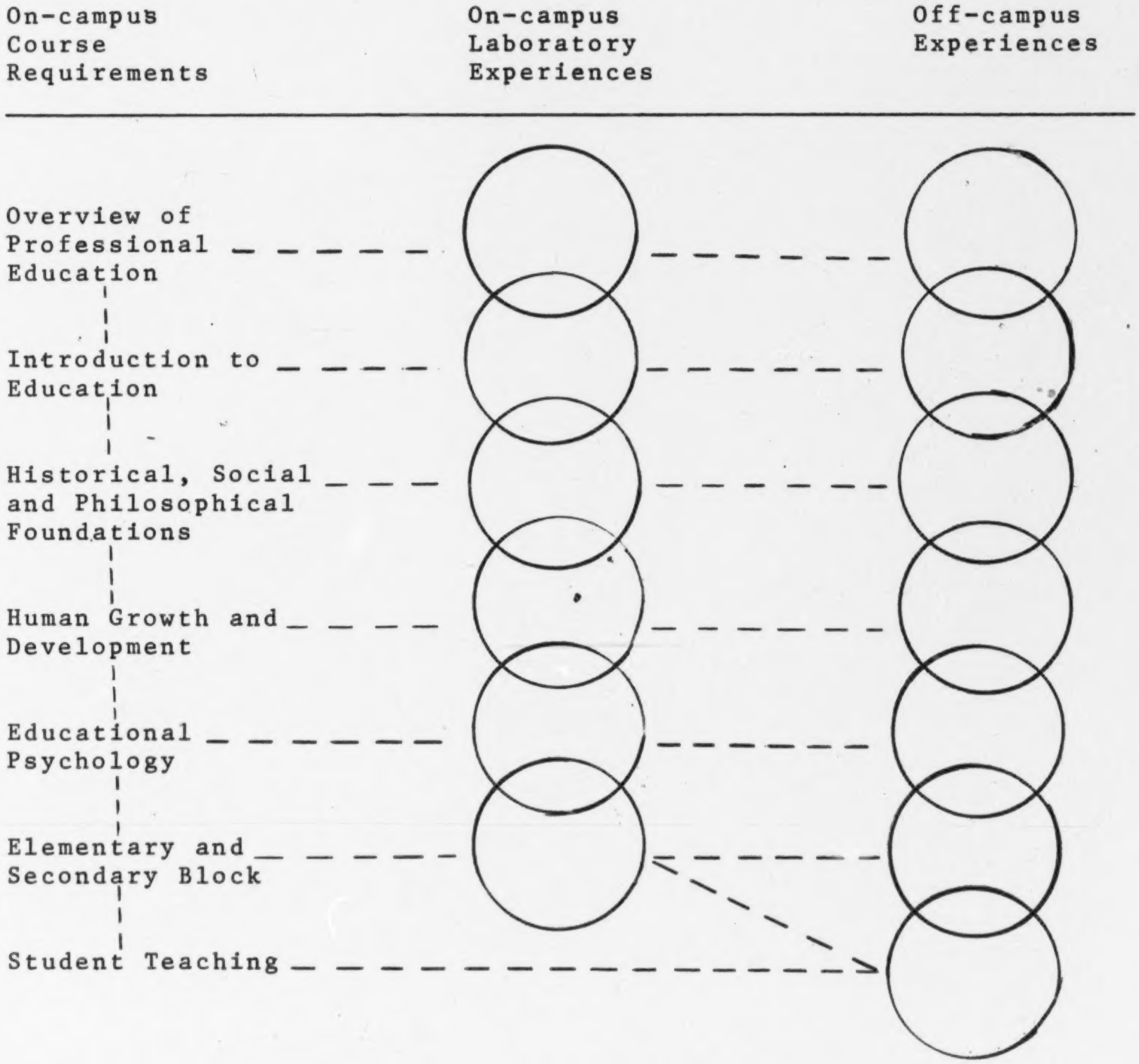
Project involvement has resulted in a restructuring of our instructional philosophy. The more obvious changes are:

1. more student involvement in the classroom learning environment;
2. more use of audio-visual aids for simulation and presentation of content; and
3. inclusion of mediated remedial loops in the instructional design.

Experimental research done on our campus during the pilot study phase indicate that these changes have resulted in larger mean gain scores in our experimental project design than in our traditional presentation modes.

2. Changes in course sequencing

Project involvement has contributed to a re-evaluation of our 1967 instructional design and has been of value in the planning of a revised instructional model that provides an integrated and sequenced program of pre-student teaching field experiences. The following is the proposed Fairmont State College model.


On-campus Course Requirements
On-campus Laboratory Experiences
Off-campus Experiences
Overview of Professional Education
Introduction to Education
Historical, Social and Philosophical Foundations
Human Growth and Development
Educational Psychology
Elementary and Secondary Block
Student Teaching

3. Changes in the use of facilities or in the design of new facilities

Our involvement in the Title III Project was a contributing factor in the establishment of Fairmont's Learning Resource Center. The establishment of this supporting facility has allowed greater flexibility in presenting content and, more importantly, has given our students greater opportunity to become involved in the instructional program.

4. Changes in the emphasis of mode of instruction

Our instructional program has experienced several instructional mode changes. The most obvious change is a greater emphasis on a mediated presentation mode. This presentation mode is used in the presentation of content and in the use of classroom simulation. A second change has been the greater use of mediated technology for the self-evaluation of performance activities both in our classrooms and for student teaching performance in the public schools. The final major change in presentation modes has been our recent emphasis with individualized instruction with both primary and remedial content.

We attribute these presentation mode changes to our involvement in the Federal Project.

5. The addition of new content areas

Many of the courses listed in our teacher education program (see enclosed outline form) have either added new content or have included project produced materials as a result of our project affiliation. In several cases project produced materials have been revised and included into courses as sub-units.

TEACHER EDUCATION PROGRAM

Fairmont State College

Course No.	Course Title	Credit Hours
Ed. 100	An Overview of Professional Education	0
Ed. 200	Introduction to Education	3
Ed. 250	Social Foundations of American Education	3
Ed. 302	Human Growth and Development	3
Ed. 303	Educational Psychology	3
		12
	ELEMENTARY BLOCK	
Ed. 400	Reading in the Elementary School	2
Ed. 405	Mathematics in the Elementary School	2
Ed. 410	Language Arts in the Elementary School	2
Ed. 412	Science in the Elementary School	2
Ed. 415	Social Studies in the Elementary School	2
Ed. 420	Observation and Directed Teaching	6
	Student Teaching Seminars (6)	0
		16
	SECONDARY BLOCK	
Ed. 430	Reading in the Secondary School	2
Ed. 431	Methods and Materials in (Appropriate Teaching Field)	3
Ed. 440	Evaluation in the Secondary School	2
Ed. 442	Instruction in the Secondary School	2
Ed. 450	Observation and Directed Teaching	6
	Student Teaching Seminars (6)	0
		15

1-12 BLOCK COMPONENTS

Ed. 410	Language Arts in the Elementary School	2
Ed. 431	Methods and Materials in (Appropriate Teaching Field)	3
Ed. 440	Evaluation in the Secondary School	2
Ed. 442	Instruction in the Secondary School	3
Ed. 420	Observation and Directed Teaching	3
Ed. 450	Observation and Directed Teaching	3
	Student Teaching Seminars (6)	0
		16

7. Other Comments

The following remarks were made by administrative leadership in reference to Fairmont State College's participation in the Federal Program Title III Project.

> The CPSDI Program has increased our awareness of a wide variety of instructional techniques and media. We have incorporated some of these ideas into our present program, and have definite plans to utilize additional media when our new health and physical education building has been completed.

> Our attendance at the summer workshop under Title III CPSDI has resulted in several improvements in the curriculum of the Fine Arts Division. Both our departments, art and music, are rewriting their objectives and syllabi for various courses of their curriculum to use techniques demonstrated in both the 1969 and 1970 workshops. We deem these workshops as highly motivating and successful in making changes for improvement among the participants.

> Since I joined the staff of the Division of Education in the fall of 1969, my evaluation of the CPSDI project is necessarily limited to the last two years of its operation.
>
> In my opinion, the results of our involvement in the Federal Project have strengthened our program in the following ways:
>
> 1. Stimulated comprehensive examination of the total program.
> 2. Stimulated the development of a modified and/or refined program to be presented for reaction and implementation in the very near future.

3. Stimulated individual inspection of respective courses, content and related learning activities by respective faculty members responsible for instruction.

4. Stimulated increased awareness and use of educational media in instruction.

5. Provided educational hardware and software for instructional purposes in the entire program.

6. Provided outside resources, physical and fiscal, to stimulate and train persons in newer instructional strategies.

7. Provided released time for Division members to pursue formal advanced training.

Perhaps the biggest single change in curriculum fostered by the CPSDI project was the self examination and evaluation of the existing program.

During the past four years I have observed a marked change in the presentation of instructional materials where teacher education is concerned.. Teachers have become more aware of the responsibility of the student as it concerns his ability to teach that which he has learned.

The writing of objectives, the preparation of plans, and the development of teaching attitudes has become more a part of the on-going instruction.

Certainly the workshops and continuing work of the CPSDI program has had a direct influence on the programs of the teachers in the division of industrial-technical education.

I am pleased to write a brief evaluation about the result of our participacing in the Federal Program, Title III, CPSDI.

While I have not been intimately involved in this project as it has developed, I have been part of a number of conferences as well as reporting sessions throughout the duration of the project. As a result, it is my opinion that the following can be listed as tangible results:

(1) The total curriculum in professional education and related areas of our Teacher Education Program has been modified significantly. I am confident that there is more unity in the total program of Teacher Education than was previously true.

(2) Those working in Teacher Education have grown tremendously in the use of various media, including educational television, and as a further result our graduates in Teacher Education have had experiences in the various media.

(3) A less tangible result, though an obvious one, is the inservice growth which our faculty members have experienced because of participating in this project.

In all, our participation in this federal project has resulted in significant improvement in our Teacher Education Program and in noticeable professional growth of our faculty.

It is a pleasure to respond to your request for a brief evaluation of our participation in the Federal Program under Title III, Higher Education Act. The Cooperative Project for Strengthening Developing Institutions (CPSDI) which was initiated in 1967 has effected the following changes and benefits:

(1) The Project brought together key personnel in education from three state colleges and a state university for the purpose of planning curriculum change and developing, testing and implementing curriculum materials. This resulted in a mutual exchange of ideas and help in program planning and development. The Project provided a unique opportunity for joint study and planning.

(2) The Project provided an opportunity for inservice growth of faculty. Staff members from the Division of Education, and selected faculty from all divisions and departments involved in teacher preparation, participated in workshops and seminars on and off campus. They attended regional and national meetings for study of teacher edu-

cation thereby contacting educators who normally would not be available at the institution or state level. Several faculty have upgraded their professional training to the doctoral level while engaged in CPSDI. New personnel engaged as National Teaching Fellows have continued as regular faculty members.

(3) The College has completely modified the professional education curriculum. All courses have been redesigned to provide content and experiences more relevant to current and future needs of teachers. They have been expanded to include new methods, materials and media. Complicating course refinement has been the development and procuring of institutional materials and equipment which provide a new learning climate in teacher preparation.

In summary, the Project has brought to the College an awareness of curriculum developments at the national level, an opportunity for study of innovations and experimentation with institutional media, a new model for the preparation of teachers, a significant professional growth of the faculty, and an exchange of material and professional resources among the participating institutions.

SHEPHERD COLLEGE:

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

BY

PROJECT COORDINATOR

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

1. Changes in basic philosophy

The exposure our faculty has had to the instructional technology and mediated content as a result of the Title III Developing Institutions Project has resulted in more emphasis in individualized instruction and more emphasis in the use of hardware and software in our classrooms. In addition, the equipment procured as a result of project affiliation has given us greater flexibility in the kinds of activities our students may experience in our instructional process.

2. Changes in course sequencing

During the time the College was in the Project a course in Foundations of American Education was added to the program and the two semesters of Human Growth and Development were elevated from the sophomore to the junior year. Also, the course in History and Philosophy was changed from a required course to an elective one.

3. Changes in the use of facilities or in the design of new facilities

There has been a very decided increase in use of all types of audio-visual equipment, largely because it became available for use. Video-taping equipment became available as a result of the project, and it is now considered to be one of the most effective teaching tools.

4. Changes in the emphasis of mode of instruction

As was indicated earlier, there is a greater emphasis on individualized instruction. Faculty members are much more interested in cooperative teaching and many courses are taught by teams of teachers.

5. The addition of new content areas
    a. Early Childhood Education
    b. Social Welfare Worker

6. The addition of new positions
    a. Director of Teacher Education
    b. Director of Educational Media

WEST VIRGINIA STATE: CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

BY

PROJECT COORDINATOR

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

1. Changes in basic philosophy

The philosophy of the Department of Education in 1966 might be described as laissez faire progressivism. There was no rationale no fundamentally agreed-upon philosophy for the program in teacher education. The program reflected minimum standards for the State of W. Va. plus some courses in general education required of everyone at WVSC. To the extent that a set of minimum standards constitutes the philosophy, that was the philosophy.

As a result of the experience of this Title III Project, WVSC's teacher education program now has a systematic model for teacher education program. A one-page summarization of the model is enclosed with this report. It is entitled "Levels of Involvement: A Descriptive Theory Model for Teacher Education." This process model is based on four components: the two taxonomies of educational objectives, the Gestalt concept of successive approximation, and the behavioral paradigm which has grown from the operant conditioning school.

The basic philosophy is that of a process training model with considerable room for change in substantive content as the years pass. The four components named above constitute the basis for the theory.

SEVEN LEVELS OF INVOLVEMENT

I. RECEPTION-COMPREHENSION LEVEL
Typical Classroom and Classroom-Related Activities
- lecture
- reading
- discussion
- previewing

II. EXTRAPOLATION LEVEL
Low Level Applications of Classroom Materials
- protocol materials (e. g. classroom interaction sequences with an interaction analysis system)
- other training materials (e. g. "Critical Moments" films from Indiana University)
- observations in classrooms (e. g. coding classroom interaction, analysis of teacher's reinforcement structure, analysis of teacher's planning skills)
- written problems (e. g. book of teaching problems)

III. CONTRIVED SETTINGS
High Level Application of Classroom Material in Approximations to Real Settings
- role playing
- simulation
- simulation games

IV. REAL SETTINGS: STRICTLY CONTROLLED*
College Student Engaged in Real Teaching Activities of Highly Structured Nature or Diminished Size
- micro-teaching
- tutoring
- student aide work: teaching a single lesson
- student aide work: teaching a series of controlled lessongs
- student aide work: working with one student or small group

V. REAL SETTINGS: PARTIALLY CONTROLLED
College Students Engaged as Teacher in Full Classroom Setting with Designated Supervisor(s) Normally Present
- traditional student teaching activity
- practice teaching activity

VI. REAL SETTINGS: LOOSELY CONTROLLED
College Students Engaged as Paid Teacher with Designated Supervisor Not Normally Present
- internship
- internship with team teaching

VII. REAL SETTINGS: AUTONOMOUS
Former College Student Engaged as Paid Teacher with Ultimate Responsbility for Classroom
- fulltime teacher: self-contained classroom
- fulltime teacher: team teaching situation

* These situations can be at peer level or at superior--subordinate level, as long as they are real and not role playing activities.

2. Changes in course sequencing

The sequence of courses is similar in 1971 to that prevailing in 1966, with several noticeable exceptions. Through the facilities of this project WVSC has developed a new course, Professional Skills Laboratory, which represents a capstone course, emphasizing alternative paths and self-selection. The idea for this course and most of the materials for it were developed or acquired through the Title III Project.

We have also accomplished basic restructuring of the courses, Classroom Management (Education 326, two credits, required in the elementary education sequence) and Principles of Secondary Education (Education 305, three credits, one of a group from which secondary education students must select a single course). These two courses have been modified to include a variety of technological changes. Education 326, now changed to a three-credit course, uses a base in simulation materials, plus a series of self-selection activities of the nature of the Professional Skills Laboratory. The same restructuring has been accomplished with Education 305, which is now being put into the sequence as a required course, on the notion that everyone would have skimped certain competencies in his sequence. Education 305 and Education 326 represent last-ditch efforts to flesh out the sequence.

More serious modifications have been under serious discussion for several years. These include addition of course work in Behavior Modification at or near the end of the teacher education sequence. Additionally, the basic course in human development is being reconceptualized as a course in human behavior, particularly problem behavior, to be taught as a corollary to student teaching.

3. Changes in the use of facilities or in the design of new facilities

The Division of Teacher Education will occupy three full floors of the new classroom-office building to be opened in 1971. Additionally, the mission of the teacher education program has required the building of a radio studio and television studio on the lower floors of the building.

The design of this building clearly reflects the changes brought into being as a result of this Title III Project. For example, there is a micro-teaching suite, self-instructional facilities, facilities for student production of course materials, and other facilities for the use of fairly sophisticated technology.

In the past several years, in anticipation of the new building, we have adapted the Audio-Visual Building to serve a number of functions created through this Title III project. A micro-teaching clinic has been developed there and another one has been developed in a nearby secondary school. Previewing facilities of various kinds have been constructed in the Education Building and in the Audio-Visual Building. "Laboratory" facilities have been created in both buildings, and the experience with these will be transferred to the new building.

4. Changes in the emphasis of mode of instruction

Several changes deserve to be mentioned here. The heavy emphasis now given to a variety of instructional media represents a new and exciting departure. Some courses, such as the Introduction to Education, Integrated Methods, and Classroom Management, rely on a heavy base of mediated materials. The two courses in human development have built in a variety of films and other media as part of the basic syllabus. The

Educational Psychology course now requires a laboratory for the use of a variety of instructional material.

A micro-teaching facility has improved the feedback mechanism for teacher education candidates, as has the wide use of casette tape recorders. Both innovations were developed in this project.

Heavy reliance upon performance objectives has altered the syllabi in every course of the sequence. This has been the single most dramatic change, with the vast deployment of instructional materials and educational technology as the second most dominant change.

5. The addition of new content areas
   a. See sheet number 2 on changes in course sequencing.
   b. Education 420, Television in Education, has been created within the last year. This course absolutely requires the videotaping equipment purchased with money from this Title III Project and as a result of this project.

6. The addition of new positions
   a. A second person has been added to the staff of the Instructional Resources Center. It is anticipated that a third person will be added in 1971-72. These positions increase the capability for serving the teacher education program, other programs of the college, and individual students and faculty.
   b. Some personnel resources have been diverted, on a somewhat regular basis, to behaviorizing of existing courses or construction of new courses. Additionally, personnel are now allocated to the videotape systems for use in micro-teaching.

c. The coordination of instructional resources management for the college has been housed in the Division of Teacher Education, with a coordinator especially designated for the area. A second coordinator for laboratory and field experiences, of which student teaching is only one part. Control over the day-by-day running of these programs has been delegated to a coordinator of academic affairs (i.e. the Department Chairman). Overall supervision of the programs has been delegated to the chairman of the Division of Teacher Education, a post created in 1970 in acknowledgement of the diversified functions in teacher education.

7. Other comments

   a. For a program in Urban Education to begin in 1971-72, new materials for simulation and micro-teaching are being acquired.

   b. The purchase and development of a variety of training and protocol materials has been a major outgrowth of this Title III Project, and this emphasis will continue on unabated into the future.

   c. New facilities are being created for previewing a vast battery of instructional materials that will arrive starting in Fall, 1971.

   d. Peer-production of instructional materials, based upon an agreed upon set of behavioral objectives, has been made a part of the program in 1971. And this emphasis will undoubtedly continue and accelerate in succeeding years.

In summary, the partnership under this Title III Project has had a dramatic and irreversible impact on the teacher education programs at West Virginia State College. Additionally, the dramatic changes in teacher education programs have had a profound effect upon other departments and upon the college itself. This is especially true in the vast increase in the use of instructional materials and in the recognized need for designing performance competencies as the basis for a new general studies program.

GOAL #2: PARTIALLY ACCOMPLISHED

DIVISION OF TEACHER EDUCATION

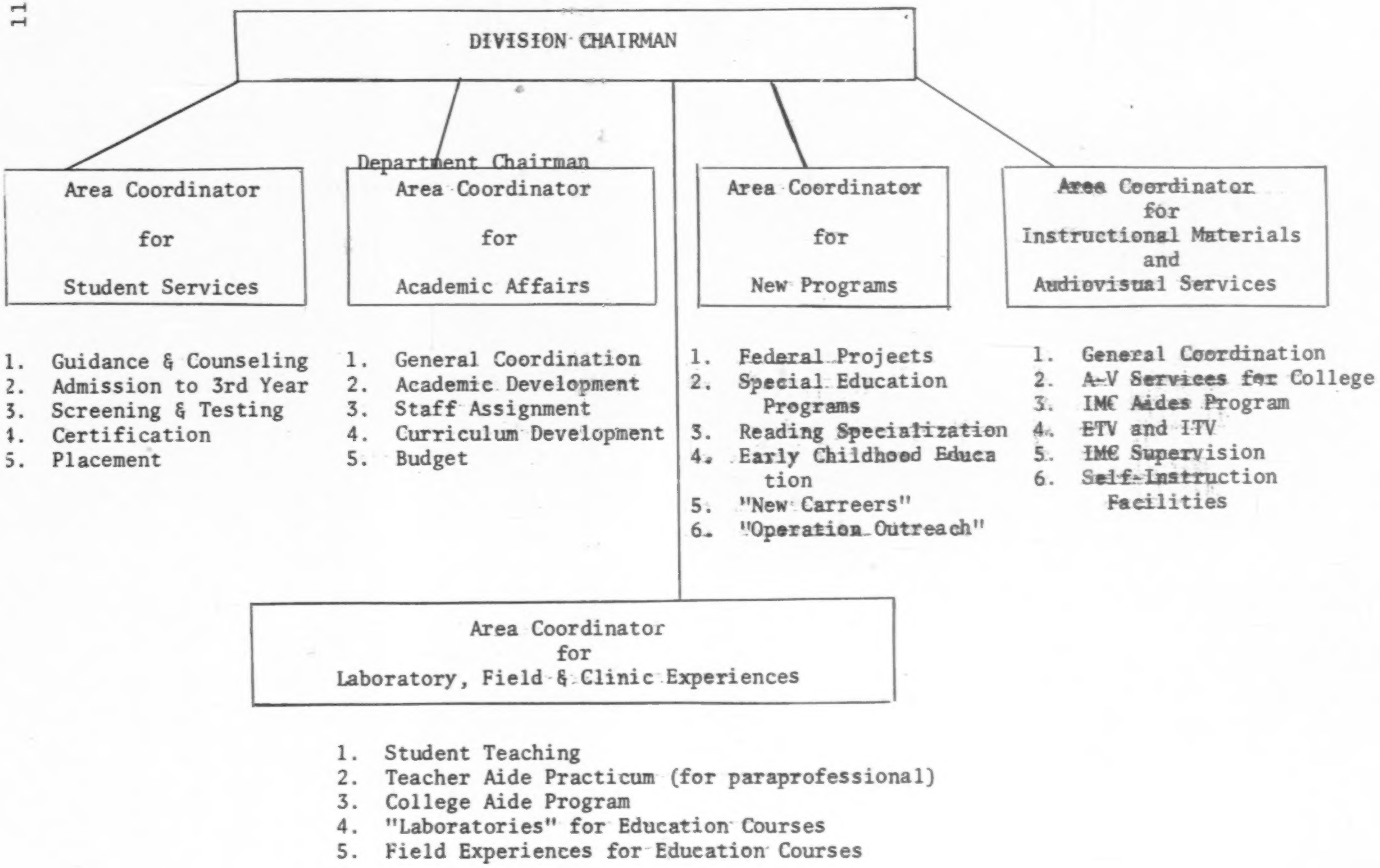

DIVISION CHAIRMAN
Area Coordinator for Student Services
1. Guidance & Counseling
2. Admission to 3rd Year
3. Screening & Testing
4. Certification
5. Placement
Department Chairman
Area Coordinator for Academic Affairs
1. General Coordination
2. Academic Development
3. Staff Assignment
4. Curriculum Development
5. Budget
Area Coordinator for New Programs
1. Federal Projects
2. Special Education Programs
3. Reading Specialization
4. Early Childhood Education
5. "New Carreers"
6. "Operation Outreach"
Area Coordinator for Instructional Materials and Audiovisual Services
1. General Coordination
2. A-V Services for College
3. IMC Aides Program
4. ETV and ITV
5. IMC Supervision
6. Self-Instruction Facilities
Area Coordinator for Laboratory, Field & Clinic Experiences
1. Student Teaching
2. Teacher Aide Practicum (for paraprofessional)
3. College Aide Program
4. "Laboratories" for Education Courses
5. Field Experiences for Education Courses

FIGURE 4. DIVISION OF TEACHER EDUCATION AT WEST VIRGINIA UNIVERSITY

JOB DESCRIPTION

AREA COORDINATOR FOR ACADEMIC AFFAIRS
(approximately ¼ load)

1. Staff Scheduling and Assignments

2. Coordination of Departmental Affairs
    - a. Reproduction Facilities, Schedules
    - b. Duties and Schedules for Secretaries and Student Labor
    - c. Assignment of Office Space and Classrooms

3. Curriculum Supervision
    - a. Syllabi
    - b. Out-of-Class Activities
    - c. Textbook Selection
    - d. General Supervision of Registration and Student Placement

4.
    - a. Book Orders, Textbook Requisitions
    - b. Supplies & Equipment for Department - requisitions, inventory
    - c. Travel Allocations

JOB DESCRIPTION

CHAIRMAN OF THE DIVISION OF TEACHER EDUCATION
(approximately ½ load)

1. Departmental Curriculum Development
    a. Long-range Planning for Instructional Programs
    b. Proposal Development (i.e. funding)
    c. Sequence Redevelopment
    d. Recruitment & Faculty Retraining
    e. Development & Coordination of Ancillary Department Activities
    f. Inter-Departmental Functions (courses, faculty, students)

2. New (Extra-Departmental) Program Development
    a. Relationships with Agencies and Institutions
    b. Program Development
    c. Proposal Development (i.e. funding)
    d. Personnel Recruitment & Training
    e. Student Recruitment

3. Budgeting (Overall Budgeting for Operating Units)

4. Accreditation Proceeding (NCATE, North Central Assn, State of West Virginia)
    a. Preparation of Accreditation Documents
    b. Liaison Function for Fulfilling Requirements
    c. Coordination of Campus Accreditation Committees

5. Representative of College and Division
    a. American Assn. of Colleges for Teacher Education
    b. Teacher Education Advisory Committee to Board of Education, State of West Virginia
    c. Public Agencies, Colleges, etc.

WEST VIRGINIA UNIVERSITY

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

BY

PROJECT COORDINATOR

CURRICULUM CHANGES AT THE DEPARTMENTAL, DIVISIONAL, OR COLLEGE LEVEL

1. Changes in basic philosophy

The teacher training program at West Virginia University experienced a philosophical change in its approach to instruction during the four years of the Title III project. Basically, the position became one of attempting to develop an instructional program that incorporated the basic principles being taught. Not only should students learn the concepts, but they should experience them in all phases of the instructional program. Thus, units of instruction were designed and sequenced which incorporated performance objectives, mediated instructional materials, specified criteria levels, individualized rate of progression, and laboratory experiences in a micro-teaching setting. In a second course, pre-student teaching field experiences were introduced to provide opportunity for early classroom experiences. As a result, the program shifted from one of talking to students in large lectures to one of providing relative activities designed around principles being taught.

2. Changes in course sequencing

The basic courses in Educational Pshchology in the teacher education program changed from courses being offered by large lecture three times a week to one of self-instruction with small groups rather than lecture. The courses were divided into a series of smaller instructional units each of which was programmed through a Learning Center operation. Rather than the regular classroom, mediated instruction offered through a

Learning Center became the basic mode by which the courses were presented. Students were able under this situation to work on materials at their own rate and progress as they mastered each level. In addition, relative activities such as micro-teaching were incorporated to supplement the content and require from students various forms of teaching behaviors.

3. Changes in the use of facilities or in the design of new facilities

Changes in instructional mode led to an alteration and modification of space as it was designed for a new addition above the Forestry Building. Originally, the plans for this new addition called for regular classroom space to be located on the fourth floor. Since this plan failed to accommodate the instructional approach being used, the design was altered to include an open Learning Center with individual carrols equipped for media, micro-teaching rooms equipped with videotape facilities and other kinds of usable space for self-instruction. This design and use of space and facilities can be attributed directly to the instructional approach developing from the Title III project.

4. Changes in the emphasis of mode of instruction

The change in mode of instruction was one which shifted from large lecture in a regular classroom three times each week to a self-instructional mode with heavy emphasis on media and actual student performance.

5. The addition of new content areas

Little was done by way of including new content areas. However, the re-design of instruction provided an opportunity to seriously evaluate the content included in the Educational Psychology courses. Consequently, some content that was considered to be irrelevant was dropped out. Also, the remaining content was re-organized into smaller, self-contained units which were sequenced throughout two courses.

6. The addition of new positions

The advantage of the Title III project was not in creating new positions, but providing released time to faculty members for course development. The project provided released time through summer and regular year for the difficult and time consuming tasks of course development.

7. Other comments

The impact of the Title III project on the Educational Psychology program in teacher education at West Virginia University is beyond all possible means of evaluation and measurement. While much of the change is visible in new learning facilities, instructional materials, new course organization the total impact generated by the project is beyond description.

III COURSE CHANGES

This section deals with specific course changes that have occurred across institutions and within institutions during the Developing Institutions Project. These changes are more specific than the general curriculum changes that are discussed earlier in this chapter. The course changes deal with the mechanics of instruction; the process variables that are manipulated in the classroom.

The analytic technique used for the identification of the changes at each institution and across institutions consisted of a pre-course description questionnaire administered to the instructors of each course offered in the departments of education at each institution in 1967 and a post-course description questionnaire administered to the instructors of each course in the departments of education in 1971. A comparison of this pre-post course evaluation has been helpful in the identification of general course changes across institutional project membership and in the identification of within institutional course changes.

Table VI is an expression of the specific mechanics of instruction that have changed during the tenure of the project. These course changes are attributed either directly or indirectly to the Developing Institutions Project.

Course Changes Across Institutions

One of the most important changes that has occurred in the classroom is the relationship between the student and the learning environment. The student is more active. He is now interacting with greater frequency with instructors, materials, and the learning environment. His control of learning gain and manipulation of content has steadily increased as a result of project impetus. The number of hours he spends in discussion groups, lab sessions, committee work, and actively involved with mediated content through the use of involvement sheets has increased.

A second course change is the increase of video-tape recording equipment, tape recorders, and slide tape programs. The diversity and amount of technological equipment and content to be used with this equipment has increased. Students are spending more time per class meeting in mediated self-instruction, in programmed instruction, with teacher prepared material, and with individualized instruction both by time and content. Large lectures, required texts and passive reception of content have decreased.

A third general change is the increase of feedback systems for instructional purposes in all institutions. The VTR has become the most important aid across institutions in allowing students and instructors to evaluate instructional performance.

In addition, instructional improvement has become an objective of both student and professor. Evaluations of techniques, approaches, objectives, and methods have become the rule rather than the exception during the last four years. Lastly, the use of pre-tests for reviving course content and objectives, for measuring pupil growth, and for use in pupil diagnosis have all increased.

A fourth general change occurring in most classrooms across institutions is the increase in the use of specific mediated content that teaches one concept and/or lesson. The slide-tape program and/or the use of specific handouts in relation to a behavioral objective are the techniques that are being used with increasing frequency for the acceleration of learning and the concretizing of content. This approach allows students to come into contact with content as often as required for mastery.

A fifth change occurring in seven of every ten classrooms across institutions is the restructuring of the measurement of student growth. Performance criteria and percentage scales have replaced the normal curve. Time is increasingly becoming a variable in the instructional design. Students work with the content and/or in remedial loops until the achievement level of the student reaches the criterion level. This means that students may spend more time or less time with the content depending upon entry skills and learning rate.

The last course change that will be mentioned is the increase of twenty-five per cent in the defining of course objectives in behavioral terms and in the increased availability of these objectives to students for instructional purposes. This instructional technique takes the guesswork out of instruction from both the student's and instructor's point of view. The learning situation is well defined; the criterion lev[illegible] specified. A student knows where he is going in the instructional sequence and more importantly, knows when he arrives.

Within Institutions' Changes

The changes in Table VI are identified by institutions so the reader will be aware of the individual differences in development that have occurred between institutions.

These differences are due to the varied institutional needs that existed by institutions when the project began. Project membership channeled resources into activities that specifically meet institutional needs.

An analysis of Table VI will give the reader an insight into and an understanding of the major activities undertaken by institutional membership. The areas that have the greatest increase are these areas that were weakest when the project began.

Table VI

COURSE CHANGES

INSTITUTIONS	A	B	C	D
Scheduling				
Sections	+34%	+12%		
Discussion Groups		+26%	+64%	+90%
Lab Sessions	+34%	+11%	+36%	
Student Activity				
Committee Work		+30% + 3 hr.	+ 6%	+60%
Student Presentations	+34%	+18% + 3 hr.		
Viewing Filmstrips & Slide Programs	+34%	+43% + 3.5 hr.		
V.T.R.	+34%	+40%	+45%	
Utilization of Aids	+100% more diversity	+ on all aids more diversity	+ on all aids more diversity	+ on all aids more diversity
Listening to Guest Lecturers	no	-19%	-40%	+60%
Demonstrations & Field Trips	+10%			+40%
Self-Instruction				
Programmed Instruction	+34%	+26%+2½ hr.	+65%	
Tape Recorder	+34%	+8%+3½ hr.	-40%	+50%
Slide Programs	+34%	+14%	+60%	+20%
Handouts	+34%	+14% mean increase of 7	-20% & mean increase of 13	
Assignments				
Required Books		-10%	-20%	
Other Texts		-10%	-60%	
Teacher Prepared Handouts	+17%	+25%	+30%	+40%
Individualization (Rate)	+34%	no	no	no
Observation	+17%	in general	+	in general
Outside		-50%	+ 6%	-12%
Arranged			+30%	

Table VI Continued

COURSE CHANGES

INSTITUTIONS	A	B	C	D
Remedial				
Kinds of Material	+34%	+30% & 4 students & 3 hrs.	+30% & 10 students	no
Review of Teacher	+34%	-25%	+30%	
Outline Provided by Teacher		-22%	+30%	
Program Material	+34%	+44%	+12%	
Evaluation				
Obj. Written in Advance	+34%	+10%		
Student Input	+10%			+60%
Available to Students	+34%	+15%	+25%	+25%
Behavioral		+25%	+70%	
Pre-test and Post-test Given	+34%	+43%	+20%	
Pre-test and Post-test Used For:				
Revising Course	+34%	+18%	+18%	+10%
Measuring Pupil Growth	+34%	+24%		
Pupil Diagnosis	+34%	- 8%	+30%	+10%
Grading				
Written by Instructor	+34%		+24%	
Standardized Tests Used	no	no & 16%		
Exams Returned	+34%	+16%		
Participation & Improvement	no	+ 7%		+40%
Returned for Instruc. Purposes	+34%	+ 7% 2.7 days		
No. of Days Decreased in Keeping Exam	+34%		+70%-1.6 days	
Curve	no			

Table VI Continued

COURSE CHANGES

INSTITUTIONS	A	B	C	D
Grading (Continued)				
Percentage Scale	+10%	+34%	+36%	+30%
Individual Progress	no		+36%	+20%
Performance Criteria	+34%	+60%	+54%	+60%
Course Evaluation				
By Students	+10%	+40%	+30%	+40%
By Questionnaire	+10%	+68%	+45%	decrease
By Administrator	+10%		+45%	decrease

CHAPTER V

AN ANALYSIS OF PROJECT RELATED RESEARCH

The purpose of this chapter is to present the statistical findings of the research done during the pilot study phase of the Title III Project. The chapter is divided into the following major parts:

1. An annotated bibliography of research papers; and
2. Research findings and conclusions

I. AN ANNOTATED BIBLIOGRAPHY

Introduction. This bibliography draws together the major research papers written during the pilot study phase of the Title III Developing Institutions Project. We have tried to follow a consistent form in presenting the abstracts. Each abstract contains the following information:

1. the objectives of the inquiry;
2. the methods and/or design; and
3. the major findings and conclusions of the paper.

The interested reader should turn to the Appendix for original sources.

Taggert, Amos, J., and M. Kalin
"Fairmont College: A Comparison of Instructional Methods"
An Unpublished Paper, 1970

The purpose of this study was to experimentally determine if project produced slide-tape programs and activity sheets are as effective in maximizing achievement as a lecture mode of instruction presently used in presenting selected content in an educational psychology class.

The experimental group, consisting of 69 senior educational psychology students, was exposed to a mediated "Educational Measurement Unit". Group B, consisting of 32 senior educational psychology students, was exposed to the same content with a lecture mode of presentation. Group C consisted of Group B students that were exposed to the slide-tape programs two days after their initial exposure to the lectures.

The data indicated that the use of project produced materials resulted in significantly fewer student errors than the lecture mode of presentation. When the project produced materials group was compared with the group that experienced both the lecture and the project produced materials (Group C) no significant differences were detected.

Camplese, Donald
"The Effects of the Mastery Method on the Verbal Behavior of Student Teachers"
An Unpublished Dissertation, West Virginia University, 1969.

The purpose of this study was twofold: One, to determine if any difference existed between the student teachers taught by the mastery method and those taught by the lecture discussion method in the use of positive reinforcement and aversive stimuli, and if there was any difference between methods in the amount of student verbal behavior exhibited by the students; two, an exploratory investigation was conducted to determine if a combination of positive reinforcement and aversive stimuli scores is a better predictor of student talk than either used alone.

Sixty student teachers were selected for this study, thirty from elementary education and thirty from secondary education. Exactly one half of each group had taken the mastery method and one half had taken the lecture discussion method of instruction in an educational psychology course, which dealt with topics concerning principles of learning. During the second week of student teaching, a twenty minute audio tape recording was taken of each student teacher. These recordings were examined by a team of raters using the Reciprocal Category System, to determine the number of occurances of positive reinforcement, aversive stimuli, and student talk. The salient features that differentiated the mastery method from the lecture discussion method were: (1) Aptitude was defined as the amount of time required by the learner to attain mastery of a learning task. The student learner was allowed to progress at a rate (time) consistent with the learners' abilities. (2) Behavioral instructional objectives were stated in terms of the student behavior which was desired, with a minimally acceptable level of student performance specified for each objective. (3) The students were encouraged to respond actively to instructional stimuli (active involvement). (4) In dealing with complex subject matter, the content was structured from the simple to the complex.

Based upon findings of the study, the following conclusions were drawn: (1) The mastery method was better able to systematically modify the verbal behavior of student teachers in the discriminate use of positive reinforcement and aversive stimuli. (2) In order to increase student verbal behavior in the classroom, one must not only increase the use of positive reinforcement but also decrease the use of aversive stimuli. (3) There was no difference in the use of positive reinforcement or aversive stimuli between elementary and secondary student teachers. (4) One program is sufficient to train both elementary and secondary student teachers in the use of positive reinforcement and aversive stimuli. (5) Elementary students displayed a greater amount of student talk than secondary, and the students taught by the mastery student teachers displayed a greater amount of student talk than the students taught by the lecture discussion teachers.

(6) Teacher praise loses some of its value as a reinforcing agent in the secondary classroom. In addition to verbal reinforcement, other payoffs for appropriate behaviors could be necessary.

Johnson, Robert, and K. Wilson
"Performance Variables in a Freely Structured Educational Psychology Course"
Paper submitted to the West Virginia Academy of Science, 1970

It was the purpose of this study to ascertain whether in a university mastery learning instructional design whether selected variables predicted student achievement, individual effort or self-concept of aptitude in an innovative introductory education course at West Virginia University.

Data for analysis was obtained from the West Virginia University Educational Psychology Data Bank. The study was limited to the data output of the Second Semester 1968-69 which consisted of 268 cases.

The variables of interest were sex, birth order, socio-economic status as measured by the fathers' North Hatt score, ACT Composite score, High School grade point average, college grade point average, type of education major, expected level of teaching, proposed extent of higher academic pursuit, number of previous psychology courses taken and expected grade in the introductory education course.

A correlational matrix was obtained for all variables of interest. In addition, a multivariate analysis was run to test for main effects and interactions.

The normal predictions of academic achievement in the traditional educational setting, such as socio-economic class, birth order, high school grade point average, were not predictors of achievement in this innovative education class. The single prediction factor was the amount of attendance, and thus individual effort that predicted achievement in this course.

Kalin, Maurice F.
"An Analysis of Learning Variables in an Individualized Model of Instruction"
Unpublished Paper, 1970

Analysis of Variance and Correlational techniques were employed to determine if aptitude as measured by the American College Testing Battery (ACT) is predictive of learning achievement as measured by post-test scores minus pre-test scores.

Data was collected from 120 subjects exposed to an Individualized Instructional Model that required student attainment of specific objectives. These data indicate that there is a significant negative relationship between aptitude and gain when gain is defined as post-test scores minus pre-test scores. When the ceiling affect is taken into consideration, there is no significant difference at the .05 level between aptitude and gain.

McAvoy, Rogers and M. Kalin
"An Analysis of Gain Scores with Unlimited and Limited Exposure to Content"
Unpublished Paper, 1970

The purpose of the present study was to investigate if unlimited or repeated exposure to content would have any affect on the dependent variable achievement as measured by post-test scores minus pre-test scores.

A control group consisting of 117 subjects was exposed to one fifty minute lecture. A second group of 236 subjects was exposed to unlimited mediated presentations of content.

These data indicate that repeated exposure to content is necessary if students are to achieve maximum performance on paper and pencil tests.

Tseng, Meng-shu, R. McAvoy and M. Kalin
"The Relationship of Aptitude to Other Variables in Mastery Learning"
Unpublished Paper, 1970

The purpose of this study was to investigate the predictive qualities of the independent variable aptitude on other dependent variables in an instructional design.

Data was collected from 120 sophomore subjects enrolled in introductory educational psychology courses and submitted to zero-order correlation, analysis of variance, and analysis of covariance.

These data indicate the following: (1) aptitude is not positively related to rate, time, gain, or post-test score at the .05 level; (2) high aptitude subjects scored higher on pre-tests and took a fewer number of post-tests; and (3) aptitude has a significant negative correlation with gain.

Minor, John
"Use of Controlled Teaching Laboratory as an Approach to Valid Classroom Tests"
Unpublished Paper, 1970

The purpose of this study was to examine the relationship between student verbal recall of course material, as measured by the course final examination, and student ability to apply this course material to the task of teaching.

The study used a random 10% sample of twenty-six (26) students enrolled in the West Virginia College of Education required course in "Human Growth and Development." The course material dealt with the use of positive reinforcement in the classroom.

A Spearman Rank Order Correlation Coefficient was used to measure the relationship between the students' performance in a controlled teaching laboratory and the unit test. The data indicated that there is no relationship between the two situations. Learning to recite as a student does not appear related to learning to teach as a teacher.

Phillips, B., and M. Kalin
"A Comparison of a Multi-Content Approach and Programmed Instruction"
Unpublished Paper, 1970

The purpose of this study was to determine if a project produced programmed text implemented at Fairmont State College could accomplish the following objectives:

1. to accelerate learning gain
2. to give students as broad a range as possible in the presentation of content without sacrificing achievement; and
3. to satisfy student requests for greater variance in presentation modes

Two class sections were randomly assigned to a control group or an experimental group. The sample consisted of 21 senior pre-service teacher education subjects assigned to the experimental group and 25 pre-service subjects assigned to the control group using a multi-content approach.

No significant difference exists in gain between the two groups at the .05 level. Even though the Project produced book did not accelerate gain, it did offer a unique instructional experience that contributed variance to an instructional program.

Riley, Ken and M. Kalin
"An Attitudinal Survey of Student Reaction to an Instructional Method"
Unpublished Paper, 1970

The intent of this study was to measure student assessment of a group mode of self-instructional approach that utilized project produced materials as an instructional method.

An attitudinal survey was administered to thirty Shepherd College senior education students at the end of a six day instructional sequence. The instructional unit consisted of behavioral objectives, mediated content, and project produced pre-tests and post-tests.

The following generalizations were concluded;

1. In the study a larger number of students had favorable attitudes toward self-instruction than students with unfavorable attitudes (16+ and 14-);

2. There were three distinct groups of students: students with extreme negative attitudes, students with extreme positive attitudes, and students clustered around the mid-point;

3. The students that have unfavorable attitudes toward self-instruction are more negative with their attitudes than those students with favorable attitudes are positive;
4. The students in the middle group with favorable attitudes toward self-instruction rate the method of presentation more positively than those students in the middle group with unfavorable attitudes rate the method negatively; and

5. One-half (16) of the students in this sample indicated they would use this method of presentation if the materials appropriate for this mode of instruction were made available.

Taggert, L. and M. Kalin
"An Attitude Survey of Student Reaction to an Instructional Method"
Unpublished Paper, 1970

The intent of the study was to collect and analyze written measures of student reactions concerning the quality of the project produced material and to evaluate student reaction to the mediated content as a method of simulated classroom observation.

Data was collected over a two year period from 168 senior subjects enrolled in an educational psychology course at Fairmont State College. The materials consisted of 16 mm INCITE Films, a "Teacher Made Tests" unit made up of slide-tape programs and written content, a written mode "Learning Unit", and a written mode entitled "Flanders Observational Material".

The conclusions of this study were as follows:

1. A significant majority of subjects reacted positively to the effectiveness of the project produced materials;

2. A significant majority of subjects reacted positively to the integrated use of simulated classroom observation techniques and regular classroom observation techniques; and

3. The subjects ranked the project produced materials higher than other commercial materials being used in this course.

Wilson, Kay
"An Investigation of Behavioral Teaching in a Micro-Teaching Course"
An unpublished paper, West Virginia University, Department of Educational
Psychology, 1970.

It was the purpose of the study to (1) measure differences between pre scores and post scores on selected teaching skills at the beginning and end of a micro-teach course to determine whether student teacher behavior had been significantly altered. (2) Ascertain which teaching behaviors were most changed, and whether skills which were not criteria specified for grade success, but were nevertheless important teaching behaviors, would develop concomitant to behaviors specified as desirable by the course instructors. (3) Determine whether variation in scores could be attributed to any variables,, including that of different instructors. (4) Analyze the differences in behavior between pre, mid and post intervals for a smaller sample of students, and thereby observe individual and group growths in behavior.

The data for this study was collected on 51 undergraduate students enrolled in an Educational Psychology course at West Virginia University.

Each micro-teach group consisted of eight students with each student teaching five micro-teach lessons. The first micro-teach was a free teach for which there were no criteria laid down, nor were any procedural suggestions offered to the students. Micro-teach II, III, and IV conformed to guide lines handed out to each student. Micro-teach V was a free micro-teach.

Each student was rated on eleven teaching skills. The difference between the pre-score obtained on the initial free teach, and the post-score obtained in micro-teach V was calculated for all 51 subjects on each of the eleven teaching behaviors.

Conclusions:

The most pertinent findings of the study were:

(a) Teaching behavior was effectively changed in the desirable direction from beginning to end of the Education 105 Micro-teaching course at West Virginia University, second semester, 1969/70. There was a significant difference between pre and post scores on nine of eleven selected behaviors, and these differences were considered to be of practical value as well as statistical significance.

(b) There was no apparent discrepancy between behaviors which were criteria laid down for grades in the course, and behaviors which were chosen by the researcher for observation, i.e., desirable behaviors increased and undesirable behaviors decreased willynilly for students undergoing the micro-teach experience.

(c) Variation within each behavioral score was considerable, but this study was limited to merely suggesting some factors which caused these fluctuations, as populations within factorial cells were fairly small. The instructor of the group appeared most frequently as a significant source of variation in scores. Sex of student also seemed often to create a difference - females generally scored better at the end of the course, but males improved the most over their pre-scores.

(d) The progression in the acquisition of desirable and shedding of undesiralbe teaching behaviors, appeared to have differentiated tremendously for each individual from pre to mid to post stages of the evaluation. However, most students exhibited behaviors (use of behavioral objectives and test items), which were course criteria, concurrent with when they were stipulated by the instructors.

(e) The average male exhibited a different progression pattern from the average female, although these patterns differed for each behavioral count.

(f) The overall learning graphs, plotted for pre, mid and post means, suggested that for the majority of behavioral counts, the average student advance further in the desirable direction with the addition of each micro-teach lesson he taught.

II RESULTS AND CONCLUSIONS

Student Attitudinal Reaction to Instructional Design:

1. Attitudinal reactions of students fall into three distinct groups: students with extreme negative attitudes, students with extreme positive attitudes, and students clustered around a mid-point. The students with unfavorable attitudes toward self-instruction are more negative with their attitudes than those students with positive attitudes are positive. The students in the middle group are more positive in their attitudes than those students in this group with unfavorable attitudes.
2. One-half of the students sampled indicated they would use this instructional design at the secondary and elementary level if appropriate materials were made available.

Student Attitudinal Reaction to Materials:

1. Subjects ranked the project materials as more effective in helping students learn than other commercial materials presently being used at the developing institutions;
2. Subjects ranked the project produced materials in general from good to excellent.

Achievement as Measured by Pencil and Paper Tests:

1. A mediated instructional approach using project produced materials resulted in fewer student errors than a lecture mode of presentation;
2. Socio-economic class, birth order, high school grade point average, and aptitude are not predictive of achievement in the instructional design developed by the project. In more traditional designs these variables are related to achievement;

3. Repeated exposure to content and length of time studying content are predictive of achievement in the instructional design developed by the project.

Modifying Verbal Behavior

1. In a traditional setting: student pencil and paper achievement test performance is not related to his verbal performance in a controlled teaching lab. A performance curriculum that teaches verbal behaviors must be implemented if verbal behaviors are to be modified;
2. The project developed performance curriculum produced significant positive changes in nine of eleven selected verbal teaching behaviors;
3. The project developed performance curriculum was better able to systematically modify the verbal behavior of student teachers in the discriminate use of positive reinforcement and aversive stimuli than a lecture method of isntruction.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this final chapter is to review in summary fashion the process and product highlights of this Developing Institutions Project. In addition, the unique features of this Project model is briefly discussed.

I A SUMMARY OF PROCESS DESIGN

In 1967, the Federal Government funded a Cooperative Title III Project that involved the following institutions: Fairmont State College, Shepherd College, West Virginia State College, and West Virginia University. The general objectives of this project were the following:

1. To apply appropriate instructional technology in the design, development, field testing, evaluation, and implementation of newer modes of instruction in teacher education;
2. To apply appropriate instructional technology in the design, development, field testing, evaluation, and implementation of new educational materials in teacher preparation;
3. To involve college faculties in the development of instructional modes and materials; and
4. To serve as a pilot test of a mode of interinstitutional cooperation.

In order to accomplish these objectives, each of the three developing institutions sent three faculty members to the campus of the cooperating University to work in teams with subject area specialist in fields such as child development, measurement, educational research and appropriate supporting personnel from areas such as art, audio-visual education, radio and television, film production, and other relevant areas.

During this developmental phase, a series of planned cooperative meetings maximized the effective use of institutional resources; brought together project membership to exchange ideas and materials; and provided an opportunity for fourteen of the top specialists in the country to generally assist Project personnel in the conceptualization and development of undergraduate teacher education instructional models and in the production of the content to be used in the instructional models.

The second phase of the project concerned itself with production of materials. First generation materials were produced, field tested and revised in a continuous process on the cooperating institutions campuses. The final productions, third generation products, were disseminated and implemented on the campuses of the developing institutions.

The final phase of the Developing Institutions Project consisted of a series of field tests conducted on the campuses of the developing institutions. Each institution field tested different units of the instructional materials. The variable of major interest in these tests were student reaction to the content, learning gain, and learning rate.

II A SUMMARY OF PROJECT RESULTS

The Title III Developing Institutions Project which was designed to make significant changes in the undergraduate teacher education program at each respective institution has accomplished this goal. The four year Project has in large part been responsible for the following specific instructional changes in each participating institution:

1. A significant increase in the use of behavioral objectives;
2. A significant increase in criterion measurement;
3. A significant increase in remedial activities;
4. A significant increase in self-instruction;
5. A significant increase in use of mediated content;
6. A significant increase of student time in different content modes;
7. A significant increase in performance activities;
8. A significant increase in the use of microteaching; and
9. A significant increase in the use of video tape machines and other educational hardware.

Secondly, the following institutional changes have been directly attributed to project affiliation:

1. The inclusion of learning centers as a part of a systems approach in undergraduate teacher education;
2. A greater emphasis on the use of a variety of instructional media and modes of instruction in presenting content;
3. The addition of systems specialists to the staffs of the participating institutions. The additions range from a Director of Education Media to technologists that maintain the resources of the learning centers;
4. A basic trend toward a more systematic instructional model for teacher education programs in participating institutions; and
5. A general upgrading of institutional faculties as a result of the project.

Thirdly, an important output of the Project is the continuing enthusiasm of the faculty at each institution. Approximately forty per cent of the staff members at each institution have indicated that they will continue to work for additional instructional efficiency after the project is terminated.

A fourth general output has been the impressive positive student reaction to the instructional models and materials. The following conclusions were generalized from the field tests:

1. Students ranked the Project produced and purchased materials from good to excellent;
2. Students ranked the project materials as more effective than other commercial materials presently being used at the developing institutions;
3. One-half of the students sampled indicated they would use the instructional design at the elementary and secondary level;

A fourth general output was the positive reaction of staff members to the instructional models and materials. The following conclusions were generalized from the field tests:

1. Eighty per cent of the faculties rated the material from good to excellent; and
2. The faculty members of each institution consistently commented that the instructional design and materials helped them to accomplish instructional objectives.

Finally, an analysis of achievement as measured by post-test minus pretest revealed the following conclusions:

1. The use of the Project produced instructional model and materials resulted in significantly higher learning gain than the instructional models and materials that were being used at the experimental institutions.

2. The project developed performance curriculum was better able to systematically modify the verbal behavior of student teachers. Student teachers left the program with greater confidence in their abilities.

III A NEW OPERATIONAL MODEL

This federally sponsored Title III Developing Institutions Project has been an organizing point for instructional change in the institutions of higher learning in the state of West Virginia. Federal support has provided the impetus for a comprehensive exploration of the technology in the changing American educational scene. But even more important, this pilot study in interinstitutional cooperation represents a unique model that emphasizes the maximization of intrainstitutional human resources.

The uniqueness of this model was not the allocation of monies to create for Developing Institutional personnel a working environment free of distractions and adversive stimuli. It was rather, the emphasis placed on the pooling of institutional human resources and the cooperative attempt to increase a knowledge base of technological knowhow. Once this base was established, a cooperative effort could be made to systematically and efficiently create the processes and the products required for change. A second unique feature of the project was the emphasis placed on the training of personnel at each institution so that innovative impetus would be sustained long after the project was terminated.

With this kind of operational model educators can maximize and sustain change with greater dollar efficiency and with a shorter subsidy period than was possible in previous Title III Developing Institutions Projects. This kind of Project model has important implications for education in general.

APPENDIX A

AN INVESTIGATION OF BEHAVIORAL TEACHING SKILLS IN A MICRO-TEACHING COURSE

PROBLEM
SUBMITTED TO DEPARTMENT OF EDUCATIONAL PSYCHOLOGY
WEST VIRGINIA UNIVERSITY

by
KAY MACLELLAN WILSON, B.A., P.C.E.

JUNE, 1970

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Introduction

Traditional teacher training programs often successfully provided the prospective teacher with sufficient expertise in curriculum content and professional knowledge, but failed him in the realm of behavioral teaching skills. The certificated novice teacher invariably confronted his first real classroom imbued with knowledge, but lacking in conception of how to impart that knowledge, and without the skills to deal with the normal classroom situation. Microteaching, which has evolved in the last decade, has become the tool in many institutions, by which student teachers can acquire the very necessary teaching behaviors and skills. Micro-teaching, which varies considerably in different contexts, has often been used before educators waited for sufficient research evidence to bear testimony to its effectiveness, although the effectiveness was obvious practically. In addition, research validating the use of the micro-teach technique in one situation need not necessarily validate the use of a different type of micro-teach technique in another situation.

The Problem

It was the purpose of this study to (1) measure the differences between pre scores and post scores on selected teaching skills at the beginning and end of a micro-teach course to determine whether student teacher behavior had been significantly altered. (2) ascertain which teaching behaviors were most changed, and whether skills which were not criteria specified for grade success, but were nevertheless important teaching behaviors, would develop concomitant to behaviors specified as desirable by the course instructors. (3) Determine whether variation in scores could be attributed to any variables, including that of different instructors. (4) analyze the differences in behavior between pre, mid and post intervals for a smaller sample of students, and thereby observe individual and group growths in behavior.

Definition of Terms

MICRO-TEACHING: Allen and Ryan (1969) state that "the term micro-teaching was first coined in 1963, but the concept has never been a static one." For the purpose of this study, micro-teaching was operationally defined as the process in which student teachers taught a prepared lesson, which lasted between five and fifteen minutes, to approximately eight of their peers, and in which the student teacher practiced specified teaching skills.

INSTRUCTOR: For better clarity, the graduate teaching assistant in charge of each micro-teach group was named the Instructor.

STUDENT OR STUDENT TEACHER: The student actually conducting the micro-teach lesson, was always referred to as the student, or student teacher.

PUPIL: The student peers being taught by the student teacher, who may or may not have assumed role playing positions, were referred to as the pupils.

The eleven teaching skills for which each student received at least a pre and post score, were rated as follows:

BEHAVIORAL OBJECTIVE: If the student stated orally, or presented written, an objective for his lesson in terms of what the pupils would accomplish by the end of the lesson, he received a score of 1. Absence of behavioral objective = 0.

COGNITIVE LEVEL OF LESSON: Rated according to Bloom's taxonomy of cognitive levels, where 1 = knowledge, 2 = comprehension, 3 = application, 4 = analysis, 5 = synthesis, 6 = evaluation.

PUPIL RESPONSES: One response was said to have occurred if i) a pupil raised his hand ii) a pupil raised his hand and verbalized iii) a pupil said something iv) a pupil actively did something as directed by the student teacher, e.g., worked on computation on blackboard, or constructed a paper hat.

A response terminated when the teacher interrupted, and a new response began at the end of a student teacher interruption. Multiple responses e.g., whole class reciting in unison, or working on problem simultaneously, were multiplied by the number of pupils responding in between teacher interruptions.

ONE-WORD PUPIL RESPONSES: This was said to have occurred if a response consisted of one verbalized word, or a hand raise which was not followed by any enunciation. Number of one word responses were multiplied by number of pupils who responded simultaneously.

UNREINFORCED RESPONSE: Any pupil response which was not positively reinforced by word, gesture, or action of the teacher, was deemed an unreinforced response.

TIME IN TEACHER TALK: Teacher talk was operationally said to be taking place whenever pupils were not responding.

LEADING QUESTIONS: A leading question was deemed to have taken place whenever the student teacher directed either a general or a specific question to the pupils.

AUDIO-VISUAL AIDS: Any auxiliary tool used by the teacher, besides the normal use of voice and action, was recorded as an audio-visual aid. The rating scale for use of audio-visual aids was: words on blackboard = 1; diagram on blackboard = 2; overhead projector = 3; items 1, 2, 3 plus prepared transparencies or plus prepared illustrations = 4; hand-out to each pupil = 4; blackboard or overhead plus hand-out to each pupil = 5; blackboard plus overhead plus handout = 6; blackboard plus prepared transparencies plus illustrations plus handouts to pupils = 7. Items not specified by the scale were rated according to the set scale.

TEST ITEMS: A test item was said to have been used, and the student scored 1, if the student teacher implemented an item requiring the response of all pupils, by which the teacher could evaluate the progress of his pupils. Absence of test item scored zero.

COGNITIVE LEVEL OF TEST ITEM: Rated as for the cognitive level of the lesson, but judged for the test alone.

INACTIVE PUPILS: A pupil was "inactive" if he had not responded once during the micro-teach lesson.

CHAPTER II

REVIEW OF THE LITERATURE

The micro-teaching concept has evoked a fairly prodigious output of reports on results from the different aspects of the technique. However, no report could be found on a situation that was the exact replicate of the micro-teach method used at West Virginia University, which was a fairly flexible one.

Allen and Ryan chose a range of examples, in their book about microteaching, "to emphasize the versatility of the technique." They then pointed out that "The questions that are raised by microteaching, . . ., far exceed the answers it has been able to supply."[1] The applicability of the micro-teaching technique in vastly divergent situations, such as the inner-city setting and a program to improve college teaching, was illustrated. Allen and Ryan described the elements of microteaching, and outlined the value of the micro-teach situation for the use of experimentation by the beginning teacher before he is confronted by a large class of real pupils. In their final chapter on research possibilities for microteaching, Allen and Ryan suggested some of the variables which could be manipulated -- this present study has manipulated some of those independent variables concerning characteristics of students at West Virginia University.

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[1] Dwight Allen and Kevin Ryan, Microteaching (Addison - Wesley Publishing, Inc., 1969, p iii.

Allen and Ryan emphasize that none of the research questions ask, "Is microteaching a better teacher training technique than something else?"[2] It was this fact, which precludes the feasibility of comparing microteaching with other techniques but rather invites the evaluation of microteaching for the acquisition of different teaching skills, which prompted this study to jettison the use of a control group.

Perlberg, Tinkham and Nelson found that the use of video-tape of student teachers in the schools was favored by student teachers, cooperating teachers and supervisors.[3] It was helpful for student teachers to have experienced micro-teaching before they entered the schools, and necessary that they were well versed in the handling of video-tape recording equipment. It was feasible to obtain "written feedback from regular classroom students."[4] Students, and more so practicing teachers, had ambivalent feelings toward viewing their performances on video tape recorders.[5] However, the two Illinois studies, were pilot studies, and no satisfactory evaluation was made.

Davis and Smoot found that beginning secondary teacher candidates who taught in four micro-teach lessons, were significantly better on 18 out of 22 teaching variables, than their counterparts who had no teaching laboratory experience.[6] However, this merely proves that experience in the teaching laboratory is better than nothing at all.

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[2] Ibid., p. 115.

[3] Ayre Perlberg, Robert Tinkham and Richard Nelson, "The Use of Portable Video Tape Recorders and Micro Teaching Techniques to Improve Instruction in Vocational-Technical Programs in Illinois: Part Two: Student Teaching Study," p. 11. (unpublished final report)

[4] Ibid., p. 18.

[5] A. Perlberg, R. Tinkham and R. Nelson, "The use of Video Tape Recorders and Micro-Teaching Techniques to Improve Instruction in Vocational-Technical Programs in Illinois: Part One: In-Service Study," p. 8. (unpublished final report)

Van Mondfrans, Smith and Feldhusen[7] found that micro-teaching effectively improved student attitudes, but failed to significantly increase achievement in course tests compared with non micro-teaching techniques.

The Far West Laboratory for Educational Research and Development in Berkeley, California, has investigated the outcomes of its program which "focuses on only one aspect of teacher education, namely developing specific teaching skills and classroom behaviors that improve teaching effectiveness.[8] The minicourse model in the Far West Laboratory differs from the Stanford micro-teach model in that being an in-service program rather than a preservice one, the minicourse offers self-contained instructional packages, uses self- and peer- evaluation rather than feedback from supervisor evaluation, and relies on instructional model tapes.[9] In the analysis of Minicourse One, ten out of twelve teaching skills were found to have been changed significantly during the course. The minicourse was effective for teachers serving areas of different socio-economic levels, there was no difference in gains between males and females, and there was virtually no loss in the acquired skills over a period of four months.[10]

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[6] O.L. Davis Jr., and B.R. Smoot, "Effects on the Verbal Teaching Behaviors of Beginning Secondary Teacher Candidates' Participation in a Program of Laboratory Teaching." (paper presented at American Educational Research Association, February 1969).

[7] A.P. VanMondfrans, F.M. Smith, and J.F. Feldhusen, "Student Attitudes and Achievements in an Educational Psychology Course after Micro-Teaching." (paper presented at American Educational Research Association, February, 1969).

[8] Walter R. Borg, Director Teacher Education Far West Laboratory for Educational Research and Development: Personal Correspondence, December, 1969.

[9] Walter Borg et al., "The Minicourse: Rationale and Uses in the Inservice Education of Teachers." (paper presented at the American Educational Research Association, Chicago, Illinois, February 8, 1968).

The research cited above is but a representative selection of what is taking place in the micro-teaching field. It also serves to show that the micro-teach technique can be used to effectively change teacher behavior, but that the micro-teach concept is a very broad one, and that the use of the technique must necessarily be evaluated in its own context.

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[10] Walter R. Borg, "The Minicourse as a Vehicle for Changing Teacher Behavior, the Research Evidence." (paper presented at the American Educational Research Association, Los Angeles, California, February 7, 1969).

CHAPTER III

THE RESEARCH METHOD AND SOURCE OF DATA

Source and Collection of Data

The data for this study were collected on 51 undergraduate students who were enrolled in the Education 105 course, an educational psychology course at West Virginia University which is a required course for prospective teachers. All data concerned students enrolled for the Second Semester 1969-70, there being 20 males and 31 females, although total population numbered 205, of which 78 were males, and 127 were females. The micro-teaching laboratories about which this study was concerned, were subsidiary to the main part of the course, and the grade obtained in them composed one-third of the overall course grade. Each micro-teach group consisted of approximately eight students, the group meeting for two hours every week. The group was run by a graduate instructor, and although behavioral objectives set were identical for all groups, treatment by different instructors varied somewhat. The nature of these differences was not examined by this study. Each student taught five micro-teach lessons, the first of which was a five minute free teach, for which there were no criteria laid down, nor any suggestions as to how the student might teach his self chosen subject. During Micro-teach II, III and IV, the student taught subject matter from his special area as outlined in articles handed out to each student. In Micro-

Teach V, the student was free to chose his subject matter, but had to teach a concept to the class. Micro-teach III and IV lasted ten minutes and Micro-teach V lasted for 15 minutes. The Micro-teach outline which gives details, can be found in the appendix of this paper, as can the pre and post assessment criteria available to each student before his preparation of each Micro-teach.

The general procedure during each Micro-teach session was as follows: Each student gave a five to fifteen minute lesson to his seven peers, which was recorded on videotape. In some groups the recording was not made. The instructor and the peers made comments and gave suggestions following each micro-teach, or collectively after all lessons had been completed. Each student received a written evaluation from the instructor. Most tapes on the free teach were played back in the laboratory sessions, while not all students viewed tapes of their later micro-teaches.

The 51 students who were randomly included in this study fell under six different instructors, three of whom were females, in groups which met at different times on different days during the week. Only four students of one male instructor were included, but there were nine or ten students under each of the other five instructors. Pre-scores were obtained during the free-teach, or Micro-teach I, post-scores during Micro-teach V, and mid-scores for 20 selected students during Micro-teach III.

Each student was rated on eleven teaching skills, viz., (i) Behavioral objectives, (ii) Cognitive level of lesson, (iii) Number of pupil responses, (iv) Percentage of one-word responses, (v) Percentage of unreinforced pupil responses, (vi) Percentage of lesson time spent in teacher talk, (vii) Number of leading questions asked, (viii) Type and amount of audio-visual aids used, (ix) Use of test item, (x) Cognitive level of test item, (xi) Number of inactive pupils. Items (iv), (v) and (vi) were rated as percentage of total responses to minimize discrepancies between the five minute and fifteen minute lessons. Scores on items (iii) and (vii) for the ten minute mid-score, and fifteen minute post score, were divided by two and by three respectively, in order to equate them with the pre-score from the five minute free teach. The precise rating standards for the eleven behaviors can be found in the Definition of Terms section of this paper. Some of the behaviors were corollaries of the assessment criteria stipulated in the course; others were not. Behavioral objectives and the desirability of teaching in the higher cognitive domains, were criteria laid out by Micro-teach II. Audience participation (termed pupil responses in this paper) was required by Micro-teach III. Test items and relevant cognitive levels thereof, were criteria of Micro-teach IV. Thus items (i), (ii), (iii), (ix) and (x) were directly related to criteria in the course. Item (v), percentage of unreinforced responses, was of particular interest as students received a thorough grounding in the theories of Operant Conditioning in the general course work.

Rating for the entire study was accomplished by one independent observer - the use of tapes was rendered impossible as not all lessons were taped, nor were lessons always fully taped. Students were aware that the observer was independent of their course, collecting general data, and that their grades were not affected by any data collected on them. Although the reliability and validity of observations was suspect because there was only one observer, this suspicion was annulled when a second observer and the observer rated tapes of the five minute free teach after the completion of the entire micro-teach course. A coefficient of reliability between scores was computed from the ungrouped scores using the Pearson Product - Moment Coefficient of Correlation. The observer's tape scores correlated with an r of .95 with scores obtained three months earlier, and scores between the two observers correlated with an r of .97.

The main source of data for the independent variables on each student was the Registrar's Office where files on each student are kept. Some information, such as College Major and amount of teaching experience, was reported on a written form by the students. The occupation of the student's legal guardian, was rated according to the North Hatt scale, a standard socio-economic rating of American occupation where 1 = U.S. Supreme Court Justice and 90 = shoeshiner.

Statistical Procedure

The difference between the pre score, obtained in the initial free teach, and the post score obtained in the final micro-teach V, was calculated for all 51 subjects on each of the eleven specified teaching behaviors. This calculated score was termed the gain score.

1) t - tests were run on each of the eleven response variables to ascertain whether there had been a significant change in the specific teaching behaviors between the initial free teach and the final micro-teach. The hypothesis that the difference between the means equaled zero, was tested for each response variable.
2) A factorial analysis was set up to obtain the overall means, variances, standard deviations, and ranges for 33 dependent variables,

i.e. the pre score, post score and gain score for each of the eleven teaching behaviors. These were then analyzed factorially into cell means, cell variances, cell standard deviations and cell ranges for eight different independent variables, viz., sex of student teacher; North Hatt status of student teacher; College grade point average; High School grade point average; teaching experience of student teacher; college major of student teacher; instructor in charge of micro-teach group; and sex of instructor. Interactions between these independent variables were also analyzed factorially.[1]

3) A general least squares analysis was run on fourteen dependent variables. These were the post scores and gain scores of seven response variables of interest which had yielded sufficient variability to render an analysis of covariance to be possible. The following output was obtained from the program:[2]

   i) Eighteen least squares constants and standard errors for five factors, one of which was nested; the two way interactions of the five factors; and for two continuous variables and their squared values. The least squares constants were calculated separately for each of the fourteen dependent variables (post and gain scores). All scores were regressed for the other factors. The five classification variables were

   ii) Partial regression coefficients for North Hatt Status, College grade point averages and their squared values, on each of the fourteen dependent variables. The least squares overall mean for the dependent variables.

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[1] The program used to compute this data was the West Virginia University "Means and Grouped Means" computer program.

[2] The West Virginia University "General Least Squares Analysis Program", January, 1970.

iii) Fourteen separate analyses of variance tables with the classification and continuous variables listed in (ii) above, as sources of variation.

Graphical Analysis of Pre-Mid-Post Scores

In addition to the pre and post scores collected for all 51 students in the study, a mid score was collected for a sample 20 students during the third micro-teach sessions. Means of the 20 students for pre scores, mid scores, and post scores, were computed. Group means for female students and for male students, were computed separately. The general learning curves for all 20 students; for the twelve female students; and for the eight male students in the sample, were plotted on a graph. Five individuals were selected and their pre, mid and post scores for the corresponding teaching behavior were plotted on a separate graph. A total of nine teaching behaviors was analyzed graphically.

CHAPTER IV

THE ANALYSIS AND RESULTS

1. Overall Changes in Behavior

The t-tests ran on the overall pre scores and post scores to test for significant changes in eleven different teaching behaviors revealed that there was a significant change from the pre to the post score, in nine teaching behaviors. Differences in two teaching behaviors, eliciting one-word pupil responses and number of unreinforced responses, were non-significant. Results have been tabulated in Table I. It will be noted that the undesirable teaching behavior of non-reinforcing pupil responses, rated as a percentage of total responses emitted by pupils, actually increased during the micro-teaching course.

2. Factorial Analysis of Differences in Scores

The factorial analysis of cell means of pre, post and gain scores on the eleven teaching behaviors for eight factors and some of their interactions, showed that different types of students under different instructors, exhibited different teaching behaviors both prior to instruction (pre-score) and after instruction (post-score); and they gained by differing amounts (gain score). Factors included in the analysis were (i) sex of student teacher (male versus female); (ii) teaching experience of student teacher (some versus none);

TABLE I

RESULTS FROM ANALYSIS OF PRE-SCORES AND POST SCORES ON ELEVEN TEACHING BEHAVIORS

N = 51

	Behavior Compared	Pre Mean	Post Mean	t	Sign. Level
1.	Total Number Pupil Responses Elicited.	6.510	12.608*	4.31	.001
2.	Percentage One-Word Pupil Responses Elicited.	22.902	22.882	0.00	n.s.
3.	Percentage Unreinforced Pupil Responses.	35.863	42.039	0.98	n.s.
4.	Percentage Time of Lesson Taken by Teacher Talk	89.020	73.843	4.61	.001
5.	Number of Leading Questions Asked	2.392	5.235*	4.23	.001
6.	Number of Inactive Pupils in Class	3.902	0.647	7.24	.001
7.	Level of Audio-Visual Aids Used.	1.804	3.118	3.79	.001
8.	Cognitive Level of Lesson	1.353	2.392	5.15	.001
9.	Use of Behavioral Objective	0.196	1.000	14.32	.001
10.	Use of Test for Evaluating Pupils.	0.235	0.686	5.28	.001
11.	Cognitive Level of Test	0.490	1.745	4.60	.001

*Divided by 3 to equate 15-minute post lesson to 5-minute free teach lesson.

(iii) major of student teacher (education majors versus non-education majors); (iv) College grade-point average of student teacher (classified as high above study sample mean of 2.5771, and low below 2.5771); (v) High School grade-point average (classified above or below study sample mean of 3.0122); (vi) North Hatt status of student teachers' guardians (a standard socio-economic rating of American occupations ranging from 1 = U.S. Supreme Court Justice, to 90 = shoeshiner. Classified in factorial analysis above or below sample study mean of 46.2745. Range of North Hatt status in study = 2 - 79.); (vii) sex of instructor in charge of micro-teach group (male versus female); (viii) instructor in charge of micro-teach group (students of six different instructors were included in this study).

Results of the factorial analysis of cell means for selected teaching behaviors have been tabulated for some of the two-way interactions in Tables II - IX which follow. Tables II - V tabulate results under the sex of student teacher by instructor interaction. The three female instructors were coded as 1, 2 and 3. The male instructors were coded as 4, 5, and 6. Mean scores of students under Instructor 4 were less meaningful due to the small number of cases in the two cells. Four behaviors, viz., percentage one-word pupil responses, percentage unreinforced responses, percentage time in teacher talk, and number of inactive pupils in class, are undesirable teaching behaviors. Thus low values for the post score, and negative values for the gain score, were desirable. Results of the sex by instructor interactions were as follows:

(a) Students under Instructors 2 and 4 taught at a higher cognitive level in micro-teach V, males did better than females. Students under these instructors had a better gain score.

TABLE II

FACTORIAL ANALYSIS OF CELL MEANS FOR COGNITIVE LEVEL LESSON AND INACTIVE PUPILS BY SEX OF STUDENT TEACHER AND BY INSTRUCTOR

		Instructor					
		1	2	3	4	5	6
MALE STUDENTS	PC	1.8	4.3	1.4	4.0	1.0	2.6
	GC	0.3	2.7	0.4	3.0	0.0	1.6
	PI	1.8	0.0	0.4	0.0	0.0	1.2
	GI	-3.0	-1.3	-4.0	0.0	-6.0	-5.2
FEMALE STUDENTS	PC	2.3	3.2	1.5	2.7	2.5	2.8
	GC	0.7	1.6	-0.7	1.7	1.5	1.8
	PI	1.3	0.0	0.0	0.0	1.0	0.8
	GI	-0.8	-2.6	-1.2	-5.3	-5.7	-3.4

P.C. = Cell Mean of Post Score on Cognitive Level of Lesson
(Overall Mean = 2.4 Range = 1.0 to 6.0)

G.C. = Cell Mean of Gain Score on Cognitive Level of Lesson
(Overall Mean = 1.04 Range = -2.0 to 5.0)

P.I. = Cell Mean of Post Score on Number of Inactive Pupils
(Overall Mean = 0.64 Range = 0.0 to 6.0)

G.I. = Cell Mean of Gain Score on Number of Inactive Pupils
(Overall Mean = -3.3 Range = -7.0 to 4.0)

Instructors 1 through 3 were Female Instructors
Instructors 4 through 6 were Male Instructors

(b) The post scores for number of inactive pupils were generally similar, although students under Instructor 1 tended to worsen. Students under male instructors tended to obtain a better gain score.

(c) Table III shows that students under Instructors 2 and 4 had more pupil responses in their last micro-teach lessons. Female students scored higher than males. Students under Instructor 5 had a low post and gain score.

(d) Students under Instructor 3 had a greater percentage of one-word pupil responses, and this behavior worsened from pre to post score.

(e) Table IV reveals that female students under Instructor 1, male and female students under Instructor 4, and female students under Instructor 6, talked the least during their last micro-teaches. The best gain scores were made by students under Instructor 4, and female students under Instructor 6.

(f) Male students generally tended to not reinforce pupil responses more than female students, although this behavior was decreased substantially by males under Instructors 1 and 2.

(g) In Table V, female students gained less than did males, on number of leading questions directed at pupils. On the post score, males fared better under Instructors 2, 4 and 5; females under Instructors 1 and 6.

(h) Students under Instructors 1, 2 and 4 used more audio-visual aids, and they improved with time.

Results from the North Hatt, College grade point average, teaching experience and college major are summarized below, and tabulated in

TABLE III

FACTORIAL ANALYSIS OF CELL MEANS FOR NUMBER RESPONSES AND ONE WORD RESPONSES BY SEX OF STUDENT AND BY INSTRUCTOR

		Instructor					
		1	2	3	4	5	6
MALE STUDENTS	PR	10.8	12.7	10.2	13.0	6.0	10.0
	GR	2.0	0.7	8.0	10.0	4.5	8.0
	PW	9.3	28.7	47.4	0.0	8.5	17.8
	GW	-3.3	-26.7	27.4	-66.0	8.5	15.0
FEMALE STUDENTS	PR	18.3	20.0	9.2	27.0	4.2	13.0
	GR	5.3	9.2	0.0	24.0	4.0	6.6
	PW	23.7	25.4	33.8	16.7	5.0	29.8
	GW	-2.5	-26.8	18.5	0.0	-11.7	7.4

P.R. = Cell Mean of Post Score on Number of Pupil Responses
(Overall Mean = 12.6 Range = 1.0 to 60.0)

G.R. = Cell Mean of Gain Score on Number of Pupil Respnses
(Overall Mean = 6.2 Range = -22.0 to 28.0)

P.W. = Cell Mean of Post Score on Percentage One Word Pupil Responses
(Overall Mean = 22.9 Range = 0.0 to 77.0

G.W. = Cell Mean of Gain Score on Percentage One Word Pupil Responses
(Overall Mean = -0.01 Range = -100.0 to 70.0)

Instructors 1 through 3 were Female Instructors
Instructors 4 through 6 were Male Instructors

TABLE IV

FACTORIAL ANALYSIS OF CELL MEANS FOR TEACHER TALK AND UNREINFORCED RESPONSES BY SEX OF STUDENT TEACHER AND BY INSTRUCTOR

		Instructor					
		1	2	3	4	5	6
MALE STUDENTS	PT	71.0	77.7	84.6	36.0	75.5	80.8
	GT	-10.8	-15.0	-9.2	-61.0	-22.0	-15.4
	PU	37.3	26.7	56.4	50.0	63.0	49.8
	GU	-25.3	-45.7	36.4	50.0	18.0	30.8
FEMALE STUDENTS	PT	59.8	75.2	85.2	50.7	86.0	64.2
	GT	-14.3	-8.6	7.8	-41.0	-13.7	-31.4
	PU	41.5	31.0	45.0	26.3	38.5	44.8
	GU	10.5	2.4	-25.8	15.3	21.8	8.8

P.T. = Cell Mean of Post Score on Percentage Time in Teacher Talk
(Overall Mean = 73.8 Range = 23.0 to 98.0)

G.T. = Cell Mean of Gain Score on Percentage Time in Teacher Talk
(Overall Mean = -14.9 Range = -63.0 to 41.0)

P.U. = Cell Mean of Post Score on Percentage Unreinforced Responses
(Overall Mean = 42.0 Range = 0.0 to 93.0)

G.U. = Cell Mean of Gain Score on Percentage Unreinforced Responses
(Overall Mean = 7.4 Range = -92.0 to 90.0)

Instructors 1 through 3 were Female Instructors
Instructors 4 through 6 were Male Instructors

Tables VI through IX. Results under the High School grade point average factor were not tabulated, as these were found to correlate generally with results under the College grade point average factor. From Table VI,

(a) Female students of a high social class scored higher on post number of pupil responses. Males and females had a better gain score.

(b) Males of a high social class fared worse on gain score of percentage of one word responses.

(c) Males and females of a high social class decreased the most on amount of lesson taken up by teacher talk, although the males of the high social class talked the most in the last micro-teach lesson.

(d) Females of a high status, and males of a low status, asked the most leading questions in their final micro-teach lessons, and had the best gain scores.

(e) Males of a high social status had the best gain score for decreasing number of inactive pupils in their classes.

(f) Females of a high status and males of a low status used the most audio-visual aids.

From Table VII:

(a) Males and females with a high College grade-point average had the best post scores and gained the most in number of pupil responses, percentage one-word responses, percentage time taken in teacher talk, and number of inactive students.

(b) Students of a low College grade-point average score better only in the number of leading questions directed at their pupils.

From Table VIII:

(a) Females with teaching experience scored the best and gained the most on all teaching behaviors.

(b) Males with no teaching experience had better gain scores on all teaching behaviors, and better post scores on all except unreinforced responses and number of leading questions, than males who had some teaching experience.

From Table IX:

(a) Non-education majors obtained the best post scores on unreinforced responses, percentage time in teacher talk, cognitive level of lesson, number of inactive students, and use of audio visual aids. However, their gain scores were best only for the cognitive level of lesson.

(b) Non-education males scored better by a substantial amount, than education males, on post responses, post percentage of unreinforced responses, post cognitive level of lesson, and gain unreinforced response. The education major males did substantially better on post and gain scores for percentage time taken in teacher talk, post and gain number of leading questions asked, and gain score in numbers of inactive students.

3. Analyses of Variance

Tests of significance were not applied to the results obtained in the simple factorial analyses. A more pertinent test was applied in the general least squares analysis. The general linear model set up for each of the 14 separate analyses of variance was as follows:

$$\begin{aligned} Xabcdfghij = {} & U + Aa + Bb + Cc + Dbd + Ff + (AB)ab \\ & + (AC)ac + (AD)abd + (AF)af + (BC)bc \\ & + (BF)bf + (CD)cbd + (CF)cf + (DF)bdf \\ & + Gg + Hh + Ii + Jj + Eabcdfghij \end{aligned}$$

where U = Population Mean, a constant
A = Sex effect
B = Sex of Instructor effect
C = Teaching Experience effect
D = Instructor nested within Sex of Instructor effect
F = College Major effect
G = North Hatt effect
H = College grade-point average effect
I = North Hatt squared effect
J = College G.P.A. squared effect.
E = Random effect, NID $(0,S^2)$

and a = 2, b = 2, c= 2, d = 6, f = 2
g, h, i, j are continuous

Thus with a total of 51 observations, there remained 20 degrees of freedom for the Error term. Each model was a complete fixed effects model, thus the mean square of the error term was the appropriate denominator for all F tests. The output yielded the Corrected Sum of Squares, Explained Sum of Squares, and the R-squared value which indicated the percentage of variability in the scores which had been explained by the factors and their two way interactions.

The sources of variation which significantly explain variability in the 14 scores (post and gain scores on seven selected teaching behaviors), have been tabulated in Table X which follows.

Thus for the 14 dependent variables, only seven scores had variation significantly explained by any single source. The sex factor explained variation in post scores on number of pupil responses, as did the sex factor when interacted with teaching experience. The instructor in charge of the micro-teach group, explained variability in student teacher scores for post number of pupil responses, and post cognitive level of lesson. Interactions of instructor with teaching

TABLE V

FACTORIAL ANALYSIS OF CELL MEANS FOR LEADING QUESTIONS AND AUDIO VISUAL AIDS BY SEX OF STUDENT TEACHER AND BY INSTRUCTOR

		Instructor					
		1	2	3	4	5	6
MALE STUDENTS	PQ	5.8	7.7	4.0	10.0	7.0	2.6
	GQ	3.0	3.7	3.4	3.0	5.5	2.2
	PV	4.5	5.3	2.6	5.0	0.5	2.0
	GV	2.5	4.3	1.2	4.0	-0.5	0.8
FEMALE STUDENTS	PQ	9.7	3.8	4.8	4.3	1.8	6.8
	GQ	7.2	-1.0	1.8	1.0	0.5	5.0
	PV	3.8	4.4	1.8	4.7	2.8	1.8
	GV	2.2	2.6	-0.7	2.7	0.0	0.2

P.Q. = Cell Means of Post Score on Number of Leading Questions
(Overall Mean = 5.2 Range = 1.0 to 20.0)

G.Q. = Cell Means of Gain Score on Number of Leading Questions
(Overall Mean = 2.8 Range = -12.0 to 19.0)

P.V. = Cell Means of Post Score on Rating of Audio-Visuals Used
(Overall Mean = 3.1 Range = 0.0 to 8.0)

G.V. = Cell Means of Gain Score on Rating of Audio-Visuals Used
(Overall Mean = 1.3 Range = -4.0 to 6.0

Instructors 1 through 3 were Female Instructors
Instructors 4 through 6 were Male Instructors

TABLE VI

FACTORIAL ANALYSIS OF CELL MEANS FOR SELECTED TEACHING BEHAVIOR SCORES BY SEX OF STUDENT TEACHER AND NORTH HATT STATUS OF GUARDIAN

NORTH HATT

	High Status		Low Status	
	Male	Female	Male	Female
PR	12.5	14.8	9.8	12.5
GR	11.3	8.5	4.0	2.8
PW	23.0	22.0	23.3	23.8
GW	23.0	-3.8	-1.4	0.9
PT	80.8	70.2	75.5	76.0
GT	-17.8	-16.9	-15.3	-9.0
PC	2.3	2.4	2.3	2.6
GC	1.3	0.9	1.1	1.1
PQ	3.5	5.9	5.6	4.1
GQ	2.8	3.4	3.4	0.9
PI	0.5	0.4	0.8	0.8
GI	-6.0	-3.2	-3.1	-2.5
PV	1.3	3.2	3.6	2.9
GV	0.5	1.1	2.1	0.7

P = Post Score Cell Mean G = Gain Score Mean

R = Number of pupil responses

W = Percentage one word responses

T = Percentage time teacher talk

V = Rating on use of audio visual aids

C = Cognitive level lesson

Q = Number leading questions

I = Number inactive pupils

TABLE VII

FACTORIAL ANALYSIS OF CELL MEANS FOR SELECTED TEACHING BEHAVIOR SCORES BY SEX AND BY COLLEGE GRADE POINT AVERAGE OF STUDENT TEACHER

COLLEGE G.P.A.

	High G.P.A.		Low G.P.A.	
	Male	Female	Male	Female
PR	8.7	14.8	11.2	13.3
GR	6.9	8.6	4.7	4.6
PW	12.6	18.4	29.1	27.1
GW	-11.1	-17.6	11.4	14.0
PT	67.4	71.2	81.5	73.1
GT	-30.9	-21.1	-7.7	-7.1
PC	2.2	2.9	2.4	1.9
GC	1.1	1.6	1.1	0.3
PQ	4.7	4.4	5.4	6.2
GQ	3.0	1.1	3.4	4.2
PI	0.9	0.0	0.7	1.2
GI	-4.0	-4.2	-3.5	-1.7
PV	2.1	3.6	3.7	2.6
GV	1.4	1.3	2.0	0.7

P = Post Score Mean G = Gain Score Mean

R = Number of pupil responses

W = Percentage one word responses

T = Percentage time teacher talk

V = Rating on use of audio visual aids

C = Cognitive level lesson

Q = Number leading questions

I = Number inactive pupils

TABLE VIII

FACTORIAL ANALYSIS OF CELL MEANS FOR SELECTED TEACHING BEHAVIOR SCORES BY SEX AND BY TEACHING EXPERIENCE OF STUDENT TEACHER

TEACHING EXPERIENCE

	Some		Some	
	Male	Female	Male	Female
PR	10.9	12.0	7.0	19.2
GR	7.2	4.6	-4.3	11.7
PW	20.3	25.1	40.3	16.4
GW	0.9	0.6	18.3	-9.4
PU	50.0	45.8	29.0	22.2
GU	6.7	6.5	23.3	-0.1
PT	74.6	73.1	87.3	69.6
GT	-19.5	-13.5	5.0	-16.3
PQ	5.1	5.1	5.7	5.8
GQ	3.4	2.0	2.3	4.1
PI	0.6	0.8	1.7	0.0
GI	-3.9	-2.7	-2.3	-3.6
PV	3.2	2.8	3.0	3.9
GV	1.9	0.5	1.0	2.1

P = Post Score Cell Mean G = Gain Score Mean

R = Number of pupil responses

W = Percentage one word responses

U = Percentage unreinforced responses

V = Rating on use of audio visual aids

T = Percentage time in teacher talk

Q = Number leading questions

I = Number inactive pupils

TABLE IX

FACTORIAL ANALYSIS OF CELL MEANS FOR SELECTED TEACHING BEHAVIOR SCORES BY SEX AND BY MAJOR OF STUDENT TEACHER

COLLEGE MAJOR

	Non-Education Majors		Education Majors	
	Male	Female	Male	Female
PR	28.6	19.0	18.0	26.5
GR	2.0	-17.2	5.0	13.6
PU	41.5	34.6	52.1	43.6
GU	3.2	5.1	15.2	4.0
PT	80.5	70.4	72.6	73.9
GT	-8.8	-20.4	-22.8	-7.8
PC	2.6	3.0	2.0	1.8
GC	1.2	1.6	1.0	0.4
PQ	4.7	4.2	5.6	6.5
GQ	2.6	1.3	3.9	4.0
PI	0.9	0.3	0.6	0.9
GI	-2.3	-3.4	-5.1	-2.5
PV	3.2	3.6	3.1	2.5
GV	1.9	1.7	1.7	0.3

P = Post Score Cell Mean G = Gain Score Mean

R = Number of pupil responses

U = Percentage unreinforced responses

T = Percentage time teacher talk

V = Rating on use of audio visual aids

C = Cognitive level lesson

Q = Number leading questions

I = Number inactive students

TABLE X

SUMMARY OF SIGNIFICANT RESULTS FROM ANALYSES OF VARIANCE USING LEAST SQUARES METHOD FOR 14 DIFFERENT TEACHING BEHAVIOR SCORES

DEPENDENT BEHAVIOR SCORE	SOURCE OF VARIATION	F Value*	Sign. Level
1. Post Number Pupil Responses	a. Sex	10.4	.01
	b. Instructor/Sex Inst.	3.3	.05
	c. Sex x Teaching Experience	6.2	.05
	d. Teaching Experience x Instructor/Sex Inst.	5.3	.01
	e. Major x Instructor/Sex Inst.	3.3	.05
2. Gain Number Pupil Responses	a. Instructor/Sex Instr. x Major	2.8	.05
3. Post % One-Word Responses	a. North Hatt Squared	4.4	.05
4. Post % Unreinforced Responses	a. Teach Experience x Major	4.3	.05
5. Post Cognitive Level of Lesson	a. Instructor/Sex Instr.	4.6	.01
	b. Sex x Instructor/Sex Instr.	2.9	.05
	c. College G.P.A.	4.4	.05
	d. College G.P.A. Squared	5.1	.05
6. Post Number Leading Questions	a. Sex x Instructor/Sex Inst.	3.7	.05
7. Gain Score Inactive Pupils	a. Major	4.6	.05

* Corrected to one decimal place
The Instructor/Sex Instructor had 4 d.f.
All other sources had 1 d.f.

experience explained differences in post number pupil responses and gain number pupil responses. Sex of student by instructor explained differences in scores for post cognitive level of lesson and post number of leading questions. The North Hatt status of students' guardians affected one word pupil responses elicited; teaching experience by college major the percentage of unreinforced responses; college major the gain score in number of inactive pupils; and college grade-point average significantly explained differences in the cognitive level of the final micro-teach lessons.

Although little variation was therefore significantly explained by single factors and their variations, r-squared values indicated that overall variability in scores was explained by the sources included in the analyses of variance by the following amounts:

Post number of pupil responses:	82%
Gain number of pupil responses:	69%
Post percentage one-word responses:	67%
Gain percentage one-word responses:	69%
Post percentage unreinforced responses:	55%
Gain percentage unreinforced responses:	46%
Post percentage teacher talk:	71%
Gain percentage teacher talk:	68%
Post cognitive level of lesson:	82%
Gain cognitive level of lesson:	77%
Post number leading questions:	71%
Gain number leading questions:	61%
Post number inactive pupils:	55%
Gain number inactive pupils:	73%

4. Pre Mid Post Learning Graphs

The analysis of the pre-mid-post scores, taken for 20 students within the overall study sample of 51, revealed that for only one behavior, percentage unreinforced responses, did the pre and post means of the 20 sample differ remarkably from the 51 study sample pre and post means, (the Means of the 20 sample were worse than the overall means). However, in all eleven teaching behaviors, patterns of progression from pre to post scores were very similar, thus the mid mark of the 20 sample was taken to be a fair reflection of the general population trend.

Results for the eleven different teaching behaviors were as follows:

(a) Nineteen out of 20 student stated their objectives for their lessons, behaviorally, by the mid score.

(b) Seven out of 20 students used a test item to evaluate their pupils by the mid-score. Thirteen students exhibited this behavior only in the last micro-teach (post score).

(c) Pre, mid and post means revealed a steady progression in desirable behavior from beginning to the end of the course for: (i) number of pupil responses (ii) rating of audio-visual aids (iii) number of leading questions (iv) cognitive level of test item (v) number of inactive pupils.

(d) Behavior rated by percentage of unreinforced responses remained at the same level at the mid score, but worsened by the post score.

(e) The cognitive level of the lesson lowered at the mid score, but increased significantly above the pre score in the post score.

(f) Percentage of one word responses and percentage of teacher talk, although decreasing as desired between pre and post scores, decreased even further between pre and mid scores.

Figures I through V which follow represent graphically the individual learning rates of six selected students for five separate teaching behaviors. The diversity of the individual is all too obvious.

The plotted curve of the average student shows the general trend, but scarcely illustrates the individual differences of each student. In number of pupil responses (Figure II), the eight males continually elicited fewer responses than did their twelve female counterparts. It was hoped that in percentage time spent in teacher talk, (Figure IV), percentage one-word responses, (Figure III), and percentage unreinforced responses, (Figure V), the graphs would have a marked downward trend, i.e., the undesirable behaviors would decrease. For the cognitive level of the lesson, (Figure I), percentage time in teacher talk (Figure IV), and percentage one-word pupil responses, (Figure III), males had a lower base rate than females, but the males surpassed beyond the females in the post score. Females began and ended with fewer unreinforced responses than males, but displayed a marked increase in this undesirable behavior at the mid-score (Figure V).

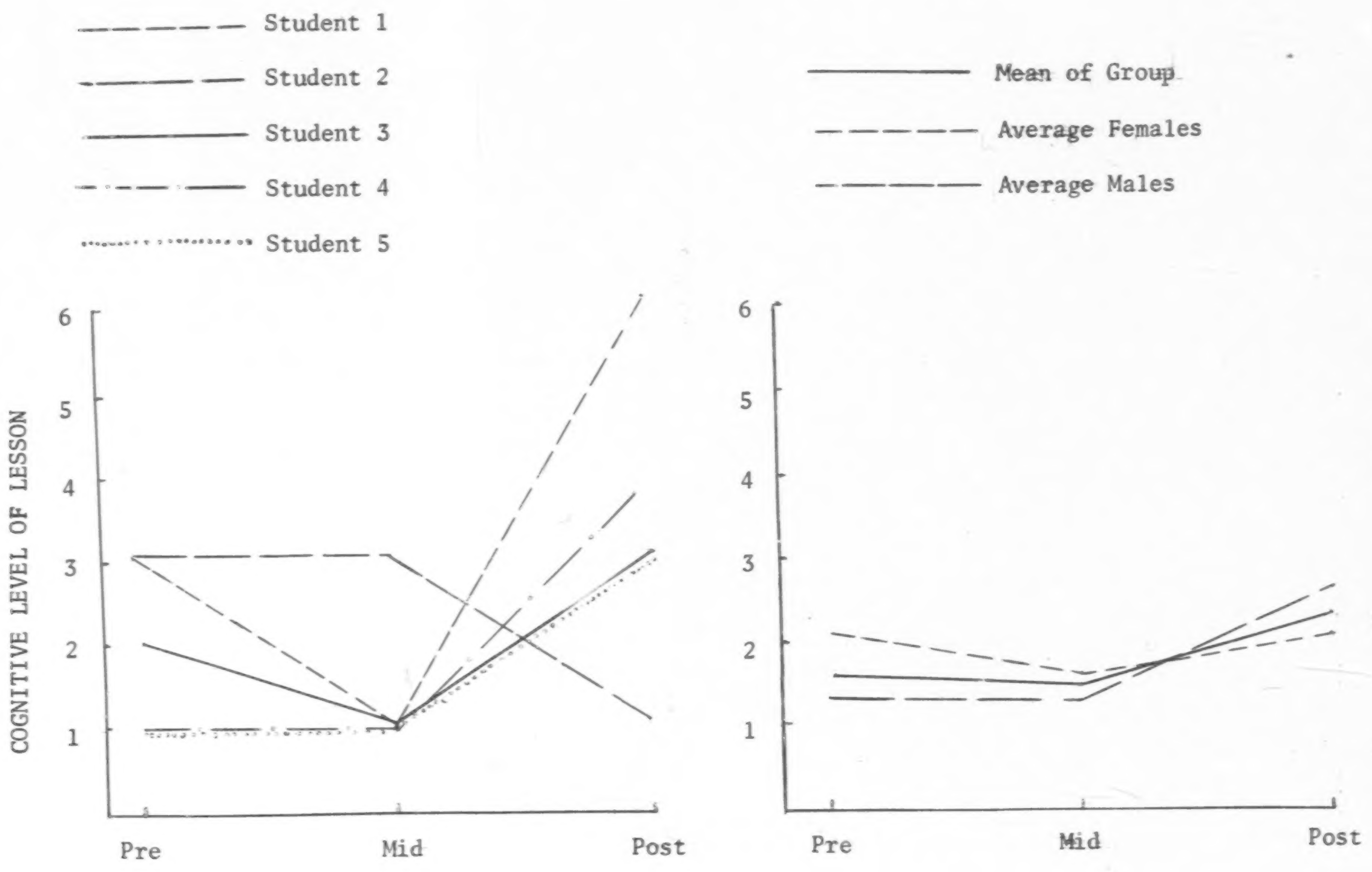

FIGURE I

PRE, MID, AND POST SCORES FOR COGNITIVE LEVEL OF LESSON

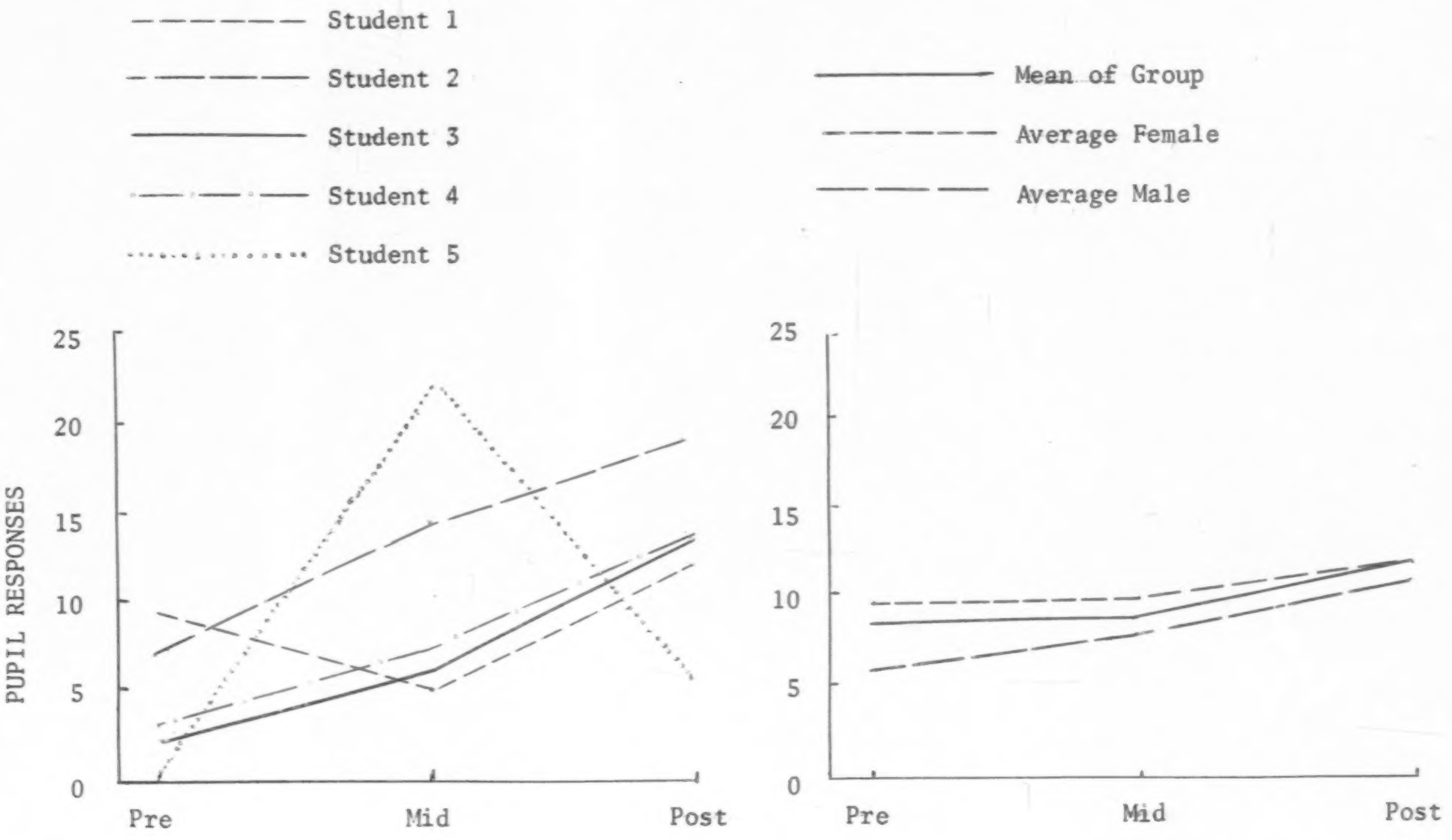

FIGURE II

PRE, MID, AND POST SCORES FOR NUMBER OF PUPIL RESPONSES

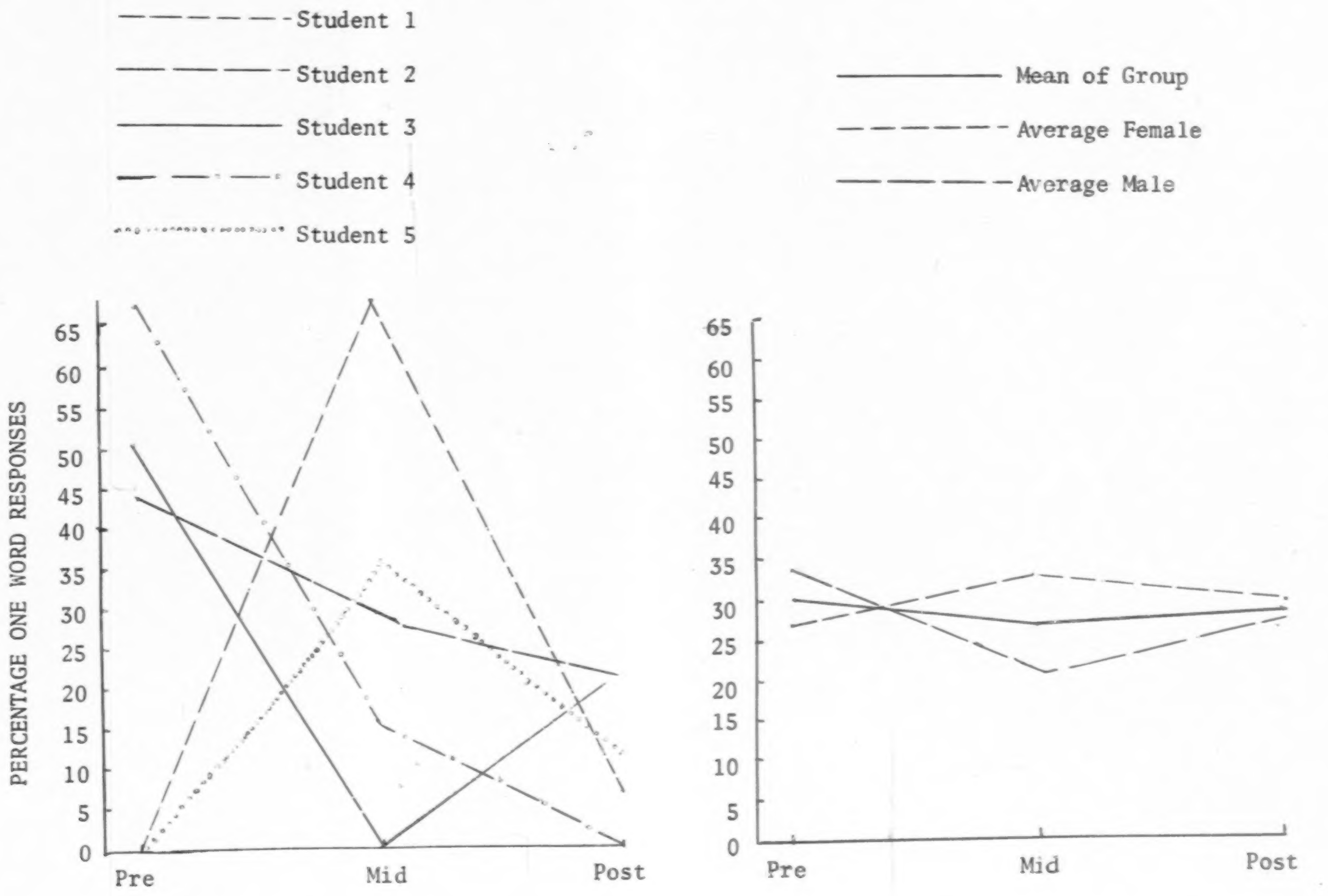

FIGURE III

PRE, MID, AND POST SCORES FOR PERCENTAGE ONE WORD RESPONSES

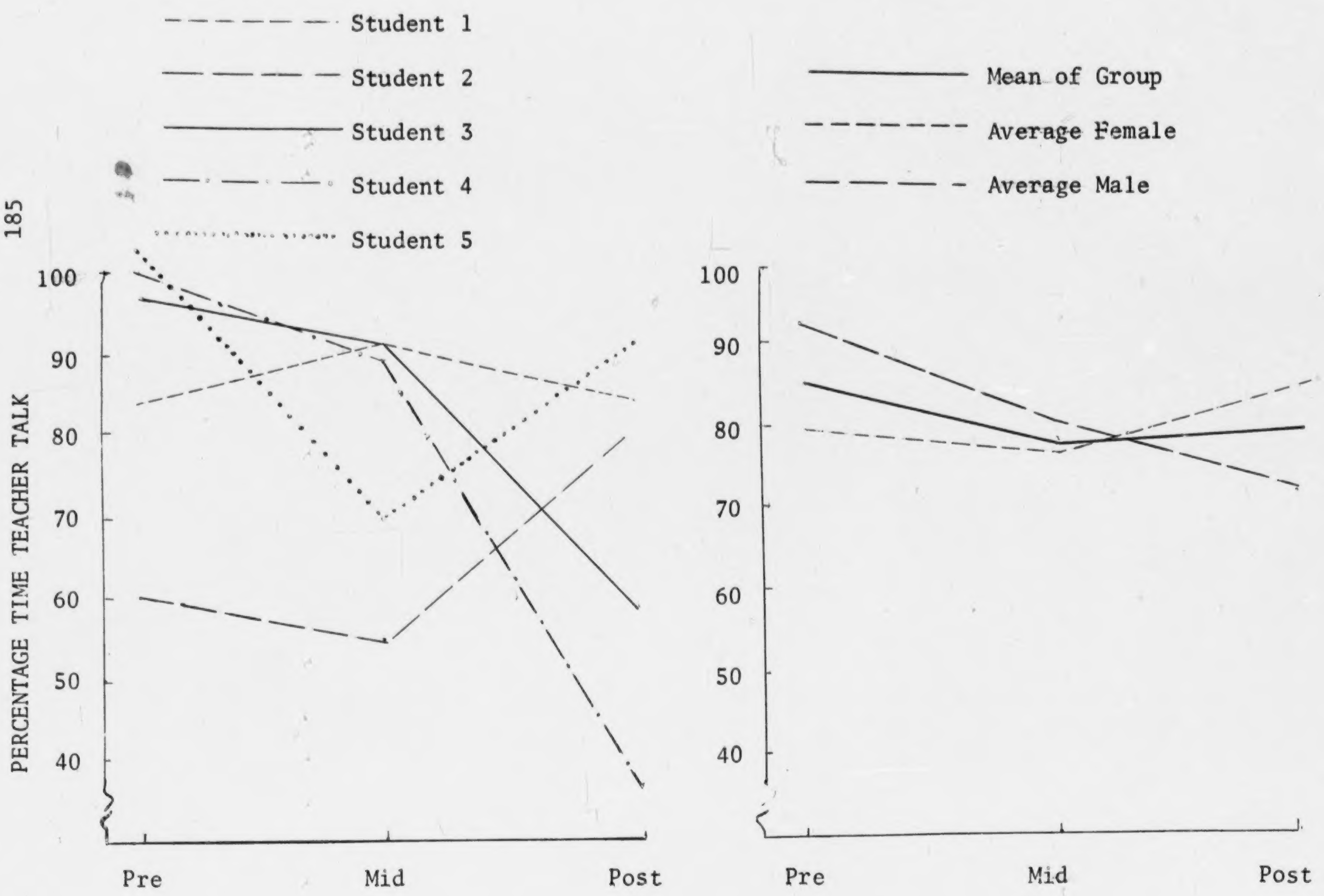

FIGURE IV

AND POST SCORES FOR PERCENTAGE TIME IN TEACHER TALK

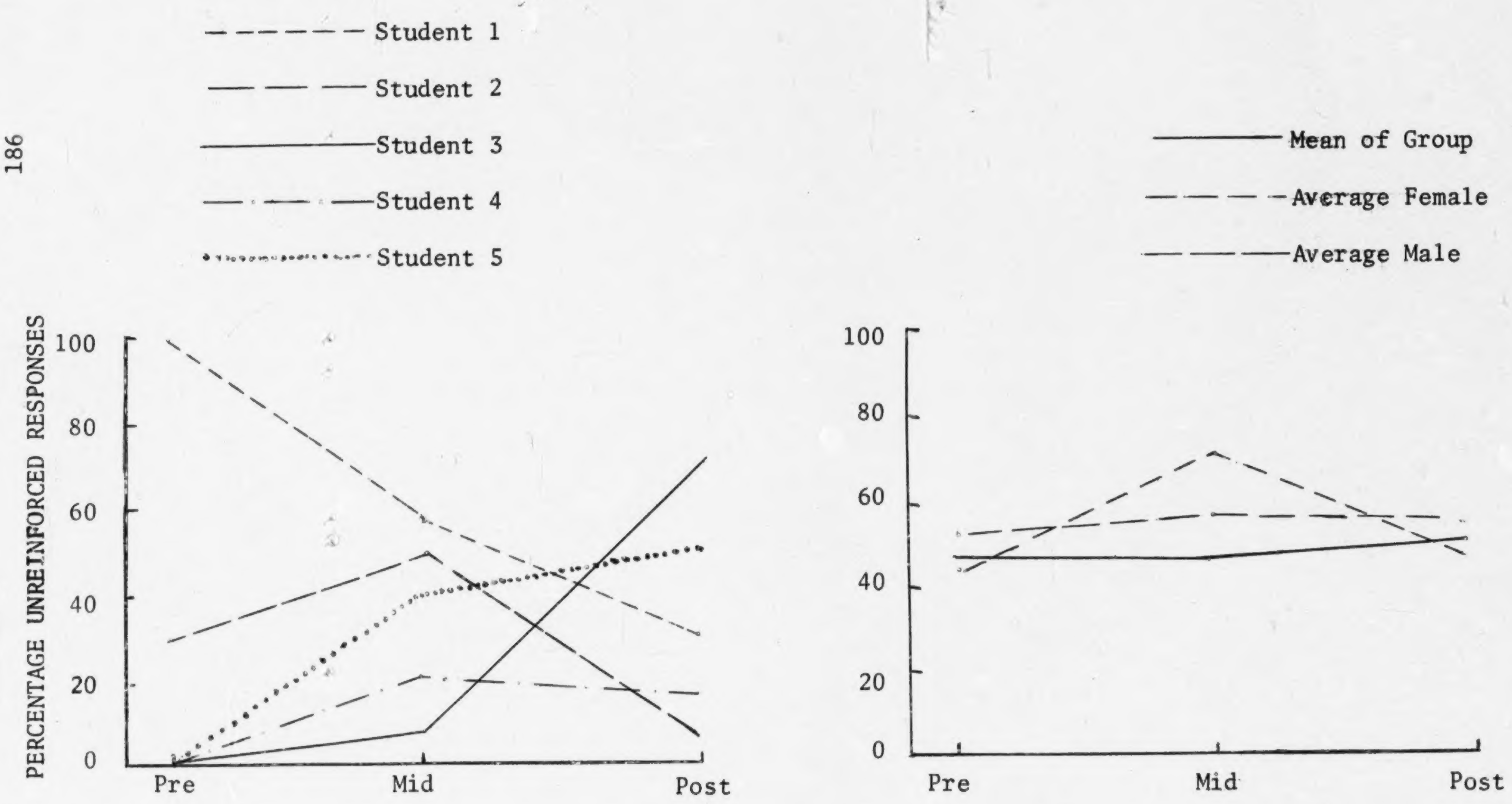

FIGURE V

PRE, MID, AND POST SCORES FOR PERCENTAGE UNREINFORCED RESPONSES

CHAPTER V

SUMMARY AND CONCLUSIONS

The most pertinent findings of the study were:

(a) Teaching behavior was effectively changed in the desirable direction from beginning to end of the Education 105 Micro-teaching course at West Virginia University, second semester, 1969/70. There was a significant difference between pre and post scores on nine of eleven selected behaviors, and these differences were considered to be of practical value as well as statistical significance.

(b) There was no apparent discrepancy between behaviors which were criteria laid down for grades in the course, and behaviors which were chosen by the researcher for observation, i.e., desirable behaviors increased and undesirable behaviors decreased willynilly for students undergoing the micro-teach experience.

(c) Variation within each behavioral score was considerable, but this study was limited to merely suggesting some factors which caused these fluctuations, as populations within factorial cells were fairly small. The instructor of the group appeared most frequently as a significant source of variation in scores. Sex of student also seemed often to create a difference - females generally scored better at the end of the course, but males improved the most over their pre-scores.

(d) The progression in the acquisition of desirable and shedding of undesirable teaching behaviors, appeared to have differentiated tremendously for each individual from pre to mid to post stages of the evaluation. However, most students exhibited behaviors (use of behavioral objectives and test items), which were course criteria, concurrent with when they were stipulated by the instructors.

(e) The average male exhibited a different progression pattern from the average female, although these patterns differed for each behavioral count.

(f) The overall learning graphs, plotted for pre, mid and post means, suggested that for the majority of behavioral counts, the average student advanced further in the desirable direction with the addition of each micro-teach lesson he taught.

It would be of interest if in a further study of this nature, a larger sample could be examined in order to determine more precisely the causes of variation in scores, so that variables might be manipulated in order to offset these causes. Additional variables might be included in the analysis to determine other sources of variation for each score. If handicaps of good performance were known, the micro-teach course could possibly be designed to compensate individuals possessing those handicaps.

The instructor variable invites further analysis. It was apparent in this study that students under one instructor achieved more than students under a different instructor, and that achievements under the six different instructors varied on different scores. In a micro-teach situation, the technique of which is so flexible, it might be beneficial for different instructors to adopt different aspects of that technique.

The fact that in this situation, the majority of students exhibited behaviors which were course criteria when these criteria were stipulated, suggests that more control can be exerted by stipulating more criterion. For instance, although the average student reduced the percentage of lesson time spent in teacher talk by 15%, a further reduction might be engineered by making reduction in teacher talk a specific course criteria. Howevever, this type of manipulation depends upon the objectives of the course as set out by its designers.

Although the average student showed a progressive improvement in behavior, the fact that for a minority of scores, students achieved best at the mid-mark, suggests that student teaching behavior should be carefully monitored throughout the course. However the general trend was as suspected, i.e., a gradual increase in desirable, and decrease in undesirable behaviors. A further study might investigate the retention of teaching skills months after completion of the course.

The primary objective of the micro-teaching laboratories was to change student teaching behavior in a desirable direction. The analysis carried out in this study revealed that this objective was more than substantially met, and that the micro-teach technique was an effective tool to achieve that objective.

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APPENDIX

MICRO TEACH 2

MT 2 PRE ASSESSMENT CRITERIA & EVALUATION

1. Is the objective stated behaviorally?
2. Is the objective higher than the knowledge level?
3. Does the objective agree with the proposed outline?
4. Is the objective a feasible one considering the time?

POST ASSESSMENT CRITERIA (Maximum 15 points)	Points
1. Was the objective taught?	3
2. Was the objective stated behaviorally?	3
3. Was the objective higher than the knowledge level?	3
4. Did the objective agree with the lesson taught?	3
5. Was the objective a feasible one considering the time limit and the grade level for which it was intended?	3

Total points received for MT 2 = ________

Micro Teach Grading

MT2 = 15 points
MT3 = 20 points
MT4 = 25 points
MT5 = 40 points

MICRO TEACH 3

MT 3 PRE ASSESSMENT CRITERIA & EVALUATION

1. Is the objective stated behaviorally?
2. Is the objective higher than the knowledge level?
3. Does the objective agree with the proposed outline?
4. Is the objective a feasible one considering the time?
5. Are provisions made to: a) increase the desirable behavior?
   b) decrease the undesirable behavior?
6. Are provisions made to increase audience participation?

POST ASSESSMENT CRITERIA (Maximum 20 points)

	Points
1. Was the objective taught?	3
2. Was the objective stated behaviorally?	3
3. Was the objective higher than the knowledge level?	3
4. Did the objective agree with the lesson taught?	3
5. Was the objective a feasible one considering the time limit and the grade level for which it was intended?	3
	15
6. Did MT 2 desirable behavior increase (Take rate)	1
7. Did MT 2 undesirable behavior decrease? (Take rate)	1
8. Was the proposed outline for gaining active audience participation carried out?	2
9. Was audience participation rate taken?	1
	5

Total points received for MT 3 = ____________

MICRO TEACH 4

MT 4 PRE ASSESSMENT CRITERIA & EVALUATION

1. Is the objective stated behaviorally?
2. Is the objective higher than the knowledge level?
3. Does the objective agree with the proposed outline?
4. Is the objective a feasible one considering the time?
5. Is the test item(s) a feasible one considering time limit and grade level for which it is intended?
6. Is there cognitive level agreement between objective and test item?

POST ASSESSMENT CRITERIA (Maximum 25 points)	Points
1. Was the objective taught?	3
2. Was the objective stated behaviorally?	3
3. Was the objective higher than the knowledge level?	3
4. Did the objective agree with the lesson taught?	3
5. Was the objective a feasible one considering the time limit and the grade level for which it was intended?	3
	15
6. Do the test items measure the objective(s)?	4
7. Proper test item construction & relevance to topic?	3
8. Is there agreement in cognitive level between the objective and the test item?	3
	10

Total points received for MT 4 = ______

MICRO TEACH 5

MT 5 PRE ASSESSMENT CRITERIA AND EVALUATION

1. Is the objective stated behaviorally?
2. Is the objective higher than the knowledge level?
3. What is the name of the concept to be taught?
4. What is one discrimination required in "understanding" the concept?
5. To what other situations should the concept transfer? (include one example of a generalization your students should be able to make)
6. Does the objective agree with the proposed outline?
7. Is the objective a feasible one considering the time?
8. Is the test item(s) a feasible one considering the time limit and grade level for which it is intended?
9. Is there cognitive level agreement between objective and test items?

POST ASSESSMENT CRITERIA (Maximum 40 points)	Points
1. Was the objective taught?	3
2. Was the objective stated behaviorally?	3
3. Was the objective higher than the knowledge level?	3
4. Did the objective agree with the lesson taught?	3
5. Was the objective a feasible one considering the time limit and the grade level for which it was intended?	3
	15
6. Do the test items measure the objective(s)?	4
7. Proper test item construction and relevance to topic?	3
8. Is there agreement in cognitive level between the objective and the test item?	3
	10
9. Were a variety of examples used in applying the concept?	5
10. Was practice given in discriminating between instances of the concept and non-instances of the concept?	5
11. Was the training situation as close to real life application of the concept as was feasible?	5
	15

Total points received for MT 5 = ________

Ed. 105

MICRO TEACH OUTLINE

Lab Session & Week		Student Tasks & Events
# 1 Jan. 26 thru Jan 30		1) General Course Information-AGI 2) Impromptu teaching task 3) Training on VTR equipment
	assignment:	4) MTI - "Free Teach" Due Lab # 2
# 2 Feb. 2 thru Feb. 6 (Base Data i.e., pre-score collected for study)		1) MTI - 5 minute "Free Teach" 2) Audience critiques each 5 min. teach. Select, for each student, one behavior to increase and one behavior to decrease in MT2.
	assignment: (from lecture)	3) The student will write 10 behavioral objectives using the instructional material provided in lecture. Due for evaluation and approval Feb. 9.
# 3 Feb. 9 thru 13	assignment: (from lecture)	1) Workshop on behavioral objectives-AGI 2) The student will revise the 10 objectives making sure to incorporate all Bloom's levels suitable for the topic chosen. Due Feb. 13.
	assignment:	3) MT2 - 5 minute teach with a behavioral objective. The student will prepare an outline for MT2 due before Lab #4 for pre-teach approval.
# 4 Feb. 16 thru Feb. 20		1) MT2 - 5 minute teach with behavioral objective 2) Audience counting behaviors to be increased and decreased 3) Audience participation-AGI
	assignment	4) MT3 - 10 minute teach, active involvement and audience participation rates The student will prepare an outline for MT3 due before Lab # 5 for pre-teach approval.

# 5 Feb. 23 thru Feb. 27 and		1) MT3 - 10 minute teach - audience participation, active involvement.
# 6 Mar. 2 thru Mar. 6		2) Test item construction-AGI
(Mid-score collected for study)	assignment: (from lecture)	3) The student will prepare test items to measure the objectives written for MT3. Due Mar. 2 for AGI approval and evaluation.
	assignment:	4) MT4 - 10 minutes teach - post test items are to measure the objectives written for MT4. The student will prepare an outline for MT4 due before Lab # 7 for pre-teach approval.
# 7 Mar. 16 thru Mar. 20 and		1) MT4 - 10 Minute teach - post teach items
# 8 Mar. 23 thru Mar. 27		2) Test items constructed cont. AGI
# 9 Mar. 30 thru April 3		1) Workshop on concept identification: generalizations and discriminations necessary to teach a concept-AGI
# 10 April 6 thru April 10	assignment: (from lecture)	2) Design an Instructional Unit. Due April 6.
	assignment:	3) MT5 - 15 minute teach - teaching a concept. The student will prepare an outline for MT5 due before Lab # 11 for pre teach approval.
# 11 April 13 thru April 17 and # 12 April 20 thru April 24 (Post-score collected for study)		1) MT5 - 15 minute teach - teaching a concept.

APPENDIX B

PERFORMANCE VARIABLES
IN A FREELY STRUCTURED
EDUCATIONAL PSYCHOLOGY COURSE

A PAPER SUBMITTED TO THE
WEST VIRGINIA ACADEMY OF SCIENCE

APRIL 1970

BY
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KAY MACLELLAN WILSON
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STATEMENT OF THE PROBLEM

A number of studies have indicated that in the traditional educational setting, student achievement, self-concept and achievement motivation can be predicted by certain known variables. Hollingshead (1949), Bruce Eckland (1964) and Patricia Sexton (1961), to name a representative few, have shown that student achievement can be predicted by socio-economic background, i.e. the lower a student's socio-economic class, the lower would be his academic score. Bradley (1968), drawing together much of the psychological literature, suggested that firstborns exhibit behaviors which appear to give them advantages over later borns in the educational process. Another factor, High School grade point average, generally correlates highly with college performance. However, these previous studies all dealt with conventional educational settings. This paper is concerned with outcomes in an innovative course, the goal of which was for all students to meet the criteria for acceptable behavior; and therefore, of necessity, final grades did not follow a normal distribution curve. Thus, it was of interest to ascertain whether, in such an innovative setting, there were predictors of student achievment, individual effort put into the course, and self-concept of aptitude in the course. Once determined, these predictors invited evaluation.

DESCRIPTION OF THE EDUCATION 105 COURSE, SECOND SEMESTER 1968-69

The course under consideration, Education 105, is an educational psychology course at West Virginia University, catalogued as "Human Growth and Development". The majority of students registered for the course were undergraduated required to have a minimum status of sophomore. Grades, which were not distributed normally, were dependent upon the results of tests which were presented frequently throughout the semester. The criteria for acceptable behavior were predetermined and made known to the students before each unit of the course; students failing to meet these criteria were allowed to repeat their efforts in order to improve their performance, and thus meet the objectives of that particular stage of the course. Students were free to retake tests a number of times if they were dissatisfied with their grade, receiving the highest grade obtained.

The course was divided broadly into three main units, viz., (a) Behavioral Objectives, which taught the students to write instructional objectives in behavioral terms at different cognitive levels, (b) Learning Unit, which primarily dealt with the psychology of learning, teaching the Reinforcement Theory and its application in the classroom situation, and (c) Measurement Unit, in which the prospective teachers acquired skills for the statistical evaluation of their students. Laboratory sessions related to the course were voluntary and were comprised of varying activities including viewing movies, listening to taped lectures, the retaking of tests, and writing of quizzes. A few teaching laboratories were held in which teaching grades were assigned; these were also available for retake.

Factors from the course of interest to this paper were individual test scores; retake test scores; teaching grade; quiz points; final grades (representing a total account of scores throughout the semester); students who obtained a course grade versus students who withdrew, failed or received an incomplete; students' expected grades and individual student attendances.

METHOD OF INVESTIGATION

Data for analysis was obtained from the West Virginia University Educational Psychology Data Bank, a report on which was written by Walls and Carter (1969), who stated that "the primary emphasis of the data bank staff to this point has been to summarize the data on the Education 105 course." The output of the data bank can be found in the Appendix of this paper. This study was limited to the data output of the Second Semester 1968-69, the primary variables of interest being sex; birth order; fathers North Hatt score (a standarlized rating on socio-economic status obtained from occupation); ACT Composite Scores (a standardized achievement test written by most students before entering West Virginia University, comprised of English, mathematics, social science and natural science scores); High School grade point average; college grade point average; type of education major (elementary versus secondary); expected level of teaching; proposed extent of higher academic pursuit; number of previous psychology courses taken; expected grade in the 105 course. Variables selected from measures in the course included grades obtained from individual tests as outlined under the description of the Education 105 course; retake test grades; quiz points; teaching grades; final grades; measures of attendances.

Total number of cases in the study was 268, with the percentage of unobtained responses varying between measures. As few as sixteen subjects retook one unit test, and a total of 105 students opted to withdraw or receive an incomplete grade for the course. The design of this experiment was limited by the data bank itself. Although an extensive recoding rendered an analysis to be possible, it was nevertheless impossible to obtain certain pertinent measures e.g. post hoc reasons for students' withdrawls from the course.

A preliminary investigation revealed that final grades did not yield a wide variance, the design of the course being implicitly projected towards this end. Sufficient variability did render individual test grades and quiz points as suitable measures of achievement. Amount of attendance was taken to be an indirect measure of (a) the individual's desire to achieve higher, presuming that he would be prepared to put more effort into the course if he desired to do better, and (b) the individual's need to make more effort in order to meet the acceptable criteria laid down by his instructors. This latter interpretation might suggest attendance to be an indirect measure of aptitude, the more capable student needing to do less in order to achieve more, but not emphatically so. Carroll (1963) suggested that the ratio of time spent in learning; time needed to learn would be a useful indicator of aptitude.

The self-concept of the student was also of interest. The grade which he expected to receive at the termination of the course, was taken to be a measure of his self-concept. Students' aspirations were recorded primarily in the level of academics they intended to pursue, and for those who were education majors, the level of classroom which they intended to teach.

HYPOTHESES TO BE INVESTIGATED

It was hoped that the following hypotheses would either be substantiated or rejected by the data.

(1) Father's North Hatt score predicts achievement.

(2) Father's North Hatt score predicts aptitude.

(3) Father's North Hatt score predicts student aspiration.

(4) Father's North Hatt score predicts student self-concept.

Mothers' and Fathers' educations were expected to support the North Hatt hypotheses.

(5) Birth order predicts achievement.

(6) Birth order predicts attendance.

(7) Expected grade predicts achievement.

(8) Sex predicts attendance.

(9) Sex predicts education major.

(10) Education major predicts attendance and achievement.

(11) Previous experience in psychology courses predicts test ranks in the learning unit.

(12) Previous experience in psychology courses predicts teaching grades.

(13) Achievement scores correlate highly with each other.

In a factorial analysis, the following interactions were investigated:

(a) sex, North Hatt status, expected grade, final grade (coded as passed course versus withdrew, incompleted, or fail) and attendance.

(b) sex, North Hatt status, birth order, ACT composite scores, attendance, high school grade point average, college grade point average, final grade (for those who passed the course), final grade (for those who passed the course versus those who withdrew, incompleted or failed), behavioral objectives post test, Learning Unit post test, Measurement Unit post test and quiz points.

In an analysis of convariance, the same variables as those in (b) above were analyzed, except that unit test scores were collapsed into one variable.

STATISTICAL PROCEDURE

(a) A correlation matrix was obtained for all variables of interest.

(b) A multivariate analysis was run to test for main effects and interactions. The multivariate test was Wilk's lambda criterion using RAO's approximate F test.

RESULTS AND DISCUSSION

The correlation matrix yielded few significant coefficients of contingency. Of the hypotheses which were to be investigated, the following results were obtained:

(a) The socio-economic status of father, rated on the standard North Hatt scale, did not correlate with variables measuring achievement (outside the course), self-concept, student aspiration, desire to achieve, aptitude, or test scores within the course. Father's and Mother's education supported the lack of correlation found in the North Hatt score. The lack of correlation in the North Hatt score was not the result of a lack of variability, for although the Education 105 sample of 44.8 fell below the national mean, (national scores range from 1-99), the sample standard deviation was 21.0 The fact that innumerable studies show social class to be a predictor of student achievement, might suggest that this sample deviated from the norm.

(b) Birth order failed to correlate with achievement scores (outside of the course), attendance, and within course achievement scores.

(c) Previous experience in psychology courses was an aid neither for better grades in the teaching laboratories, or in the Learning Unit tests, which were psychology-oriented. It had been hypothesized that a knowledge of psychology principles would help with the dealing of people in the teaching laboratories, but this was rejected. Furthermore, it appeared that little transfer of learning took place from any previous study of psychology.

(d) Sex correlated with only three variables, viz., expected level of teaching (r=-.343); hours of study during the semester (r=.391); and high school grade point averages (r=.4256). These results indicated that boys proposed to teach at higher levels of education, undertook more credit hours that semester, and received lower grade point averages at High School. However, these results are barely significant statistically, and less so practically. An r-squared value would reveal that very little variance in the variables was due to regression on sex.

(e) The grade which the students expected to obtain, correlated with some achievement measures from within the course, namely final grade (at .45, when those who withdrew or received incompletes were omitted); and with two isolated unit tests (r=.46 and.53). Again, these results were not startling in their significance.

(f) Education major had little bearing on course achievement and student aspirations.

(g) Achievement scores outside of the course, generally correlated with one another. e.g., High School grade point average with ACT composite score (.48); college grade point average (.46); ACT English (.48). The significance of this is questionable.

However, more meaningful results were acquired in the multivariate analysis of the data. A factorial design sought for interactions between three factors, sex, North Hatt status, and grade, and two variables, attendance and expected grade. North Hatt status was coded into high and low status; grade into those who passed the course versus those who vailed, withdrew or received an incomplete. Sample size was considerably reduced from the original 268, as in order to be included in the analysis, an individual was required to have a response in all of the variables and factors. When means for the attendance and expected grade variables were plotted for each factorial combination, it was found that:

(a) Students who expected high grades, passed the course.

(b) Students who passed the course, attended more often than those who failed to receive a grade.

(c) Of students who failed to receive a grade in the course, those who came from a lower socio-economic background, attended more often than students from a higher socio-economic background. Result (c) suggests that students from a lower social class who were destined not to pass, exerted more effort than students from a higher social class.

(d) Of students who failed to pass the course, females expected higher grades than males.

(e) Of students who passed the course. males expected higher grades than females.

Results (d) and (e) indicate that males were more realistic in their expectations or predictions, of their achievement. A cell analysis of means for the above factorial design can be found in Table I in the appendix of this paper. In the tests of significance using Wilk's Lambda criterion, it was revealed that the attendance and expected grade variables significantly explained variance in the pass-non-pass grade at an alpha level of less than .001, i.e. students who attended more and expected higher grades had a 99% probability of receiving a pass grade compared with their colleagues who exerted little effort and expected low grades. Although the data was weighted by students who withdrew from the course, this analysis was of interest, because in order to be included in the cell analysis, students must have recorded an expected course grade. Thus individuals who attended seldom, still expected to receive a grade, but in fact eventually failed to achieve a pass grade from the course.

The second multivariate analysis was concerned with factors of sex, father's North Hatt status and attendance; and nine variables which measured birth order, ACT composite, Behavioral Objectives post test, Learning Unit post test, grade (coded A through F for those who passed), grade (coded pass versus non pass), high school grade point average, college grade point average, and quiz points. Cell means for each factorial combination can be found in Tables II through V in the appendix of this paper. Within cell correlations for all factors and variables included in the second multivariate analysis can be found in Table VI in the appendix of this paper.

It was of interest to this study to determine whether birth order would serve as a predictor of course achievement and attendance. A cursory glance at Table II will reveal that cell means for birth order failed to differentiate between low attenders and high attenders. Schacter (1959) demonstrated by experimentally inducing anxiety, that first borns seek to affiliate with others under similar stress more than do later borns. Gerard and Rabie (1961) found that first born females, when under stress, seek to affiliate more than do later born females, but the reverse effect occurred with males. However these effects were not borne out by this educational psychology course. Furthermore Table VI in the appendix, which tabulates within cell correlation coefficients, shows, that birth-order did not correlate with any variables, and that course achievement could hardly be predicted by birthorder. However, Bradley's (1968) paper has already been cited in support of the hypothesis that first borns have an advantage in the educational process. It is apparent that this hypothesis was invalidated in this particular instance.

The American College Test (ACT) composite scores failed to correlate with achievement variables, nor was variance in the ACT score explained by sex, attendance or North Hatt factors. Despite the fact that ACT score is used as a judicial measure for entry into the undergraduate college, it appears that people who scored higher performed no better in this course.

The preliminary hypothesis that achievement scores would correlate highly with each other was substantiated by the within cell correlations of the multivariate analysis (see Table VI). Results of interest were (i) unit tests correlated highly with each other (r=.63), (ii) Learning tests correlated with grade coded in two manners (r=.62; r=.67) (iii) High school grade point average correlated significantly with college grade point average (r=.802). These correlations are significant beyond the .001 level. Although the large sample size of 268 provided many correlations reaching statistical significance, very few were large enough to be of any practical value e.g. with 200 subjects, an r of .181 has a p of less than .01 for one independent variable.

The univariate analysis of variance, seeking to explain variance in the nine variables due to each single factor, showed socio-economic status (the North Hatt factor), to provide no significant F values (p less than .85). Thus a student from a higher social class had no advantage in the course over a student from a lower social class. The combination effects of North Hatt status and sex (p less than 1958), and North Hatt status and attendance (p less than .185) were similarly insignificant.

The sex factor approached significance at a probability of less than .084, although the only variable which had variability emphatically due to sex, was high school grade point average. This result has been obtained in larger populations than the one in this study.

However the univariate analysis clarified attendance to be the single important factor in explaining variance in all achievement scores. Attendance was significant at a probability of less than .001 for all variables except birthorder and ACT scores. There was also an interaction with the attendance-sex combination, with an F value of .027 level of significance. Block effects of sex-attendance-North Hatt were non-significant. It appeared that the entry of the North Hatt factor annihilated any explanation of variance.

The earlier tentative hypothesis that attendance could be interpreted as an indirect measure of aptitude (the more capable student needing to do less in order to achieve more) had to be rejected. However attendance did indirectly measure the individual's desire to achieve higher; in actuality, this desire was generally reinforced with a better grade. Indeed, attendance was the best single predictor of course achievement.

CONCLUSIONS AND RECOMMENDATIONS

The normal predictions of academic achievement in the traditional educational setting, such as socio-economic class, birth order, high school grade point average, were not predictors of achievement in the Education 105 course, second semester 1968-69. The single prediction factor was amount of attendance, and thus individual effort was generally reinforced by better grades. By knowing the amount of effort exerted by the student, one could ascertain his probable achievement in the course. It might be interpreted then, that the innovative design of the course allowed the students to compensate for their individual differences in credentials (such as social class), and that a student, by exerting more effort, achieved more in the course, irrespective of his experiences outside of the course.

An output of data of the kind stored in a data bank lends itself to multiplicative analyses. This study divulged in a small fraction of these statistical possibilities, and was exploratory in nature. It would be of value to perhaps hold more factors constant to test for further interactions, and to use more variables as independent rather than dependent measures. Of more vital interest would be to ascertain whether other innovative educational courses compensate for the individual differences which normally predict achievement in conventional settings.

TABLE I

Factorial Analysis of Cell Means For Attendance and Expected Grade

		Grade	
Sex	N. Hatt	C_1	C_2
A_1	B_1	$\overline{x}$ = 6.652 $\overline{y}$ = .391	$\overline{x}$ = 9.950 $\overline{y}$ = 1.100
	B_2	$\overline{x}$ = 4.087 $\overline{y}$ = .391	$\overline{x}$ = 11.522 $\overline{y}$ = 1.043
A_2	B_1	$\overline{x}$ = 7.029 $\overline{y}$ = .571	$\overline{x}$ = 10.857 $\overline{y}$ = .952
	B_2	$\overline{x}$ = 5.167 $\overline{y}$ = .500	$\overline{x}$ = 10.083 $\overline{y}$ = .854

$\overline{x}$ = Cell Mean of Attendance Variable

$\overline{y}$ = Cell Mean of Expected Grade Variable

A = Sex Factor: A_1 = Male; A_2 = Female

B = North Hatt Status: B_1 = Low; B_2 = High

C_1 = Non-Pass Grade: C_2 = Pass Grade in Course

TABLE II

Factorial Analysis of Cell Means For Birth Order and Act Composite Scores

Sex			Attendance C_1	Attendance C_2
A_1	N. Hatt	B_1	111 $\bar{x}$ = 2.136 $\bar{y}$ = 12.227	112 $\bar{x}$ = 1.524 $\bar{y}$ = 9.905
		B_2	121 $\bar{x}$ = 1.889 $\bar{y}$ = 12.852	122 $\bar{x}$ = 1.579 $\bar{y}$ = 11.579
A_2	N. Hatt	B_1	211 $\bar{x}$ = 1.848 $\bar{y}$ = 14.182	212 $\bar{x}$ = 1.727 $\bar{y}$ = 15.250
		B_2	221 $\bar{x}$ = 1.842 $\bar{y}$ = 13.316	222 $\bar{x}$ = 2.026 $\bar{y}$ = 14.974

$\bar{x}$ = Cell Mean of Birth Order Variable

$\bar{y}$ = Cell Mean of ACT Variable

A = Sex Factor: A_1 = Male; A_2 = Female

B = North Hatt Status: B_1 = Low; B_2 = High

C = Attendance Factor: C_1 = Low; C_2 = High

TABLE III

Factorial Analysis of Cell Means For Two Selected Post Test Scores

Attendance

Sex-			C_1	C_2
A_1	N. Hatt	B_1	$\overline{x} = 63.636$ $\overline{y} = 34.955$	$\overline{x} = 80.952$ $\overline{y} = 71.333$
		B_2	$\overline{x} = 46.296$ $\overline{y} = 35.889$	$\overline{x} = 92.316$ $\overline{y} = 78.368$
A_2	N. Hatt	B_1	$\overline{x} = 63.273$ $\overline{y} = 56.364$	$\overline{x} = 87.500$ $\overline{y} = 68.227$
		B_2	$\overline{x} = 56.316$ $\overline{y} = 43.368$	$\overline{x} = 89.821$ $\overline{y} = 77.795$

$\overline{x}$ = Cell Mean for Behavioral Objectives Test

$\overline{y}$ = Cell Mean for Learning Unit Test

A = Sex Factor: A_1 = Male; A_2 = Female

B = North Hatt Status: B_1 = Low; B_2 = High

C = Attendance Factor: C_1 = Low; C_2 = High

TABLE IV

Factorial Analysis of Cell Means for Grade Coded in Two Differing Ways

Attendance

Sex-			C_1	C_2
A_1	N. Hatt	B_1	$\bar{x} = 1.455$ $\bar{y} = 1.318$	$\bar{x} = 2.810$ $\bar{y} = 1.619$
		B_2	$\bar{x} = 1.741$ $\bar{y} = 1.333$	$\bar{x} = 3.368$ $\bar{y} = 1.737$
A_2	N. Hatt	B_1	$\bar{x} = 1.939$ $\bar{y} = 1.394$	$\bar{x} = 3.114$ $\bar{y} = 1.659$
		B_2	$\bar{x} = 1.737$ $\bar{y} = 1.342$	$\bar{x} = 3.539$ $\bar{y} = 1.718$

$\bar{x}$ = Cell Means for Students Obtaining Course Grade, Coded A through F.

$\bar{y}$ = Cell Means for Grades of All Students, Coded Pass = 2, versus Fail Withdrew or Incomplete = 1

A = Sex Factor: A_1 = Male; A_2 = Female

B = North Hatt Status: B_1 = Low; B_2 = High

C = Attendance Factor: C_1 = Low; C_2 = High

TABLE V

Factorial Analysis of Cell Means for High School Grade Point Average and Course Quiz Points

Attendance

Sex	N. Hatt	C_1	C_2
A_1	B_1	$\overline{x} = 2.773$ $\overline{y} = 15.636$	$\overline{x} = 3.524$ $\overline{y} = 20.048$
	B_2	$\overline{x} = 2.000$ $\overline{y} = 8.370$	$\overline{x} = 3.579$ $\overline{y} = 27.737$
A_2	B_1	$\overline{x} = 2.727$ $\overline{y} = 12.424$	$\overline{x} = 3.955$ $\overline{y} = 26.045$
	B_2	$\overline{x} = 2.737$ $\overline{y} = 9.605$	$\overline{x} = 4.154$ $\overline{y} = 28.077$

$\overline{x}$ = Cell Mean for High School Grade Point Average

$\overline{y}$ = Cell Mean for Course Quiz Points

A = Sex Factor: A_1 = Male; A_2 = Female

B = North Hatt Status: B_1 = Low; B_2 = High

C = Attendance Factor: C_1 = Low; C_2 = High

TABLE VI

Within Cell Correlations For All Variables In Multi-Variate Analysis

	Birthorder	ACT Score	Beh. Test	Learn. Test	Grade A-F	Grade Pass/Non Pass	Hi. Sch. G.P.A.	Coll. G.P.A
Birthorder								
ACT Score	.141							
Behavioral Test	.008	-.007						
Learning Test	.035	.020	.630					
Grade A-F	.074	.059	.409	.616				
Grade Pass/Non Pass	.061	.045	.472	.658	.971			
High School G.P.A.	-.005	-.002	.445	.544	.415	.432		
College G.P.A.	-.015	-.042	.419	.532	.397	.417	.802	
Course Quiz Points	-.053	.053	.273	.318	.258	.277	.254	.263

OUTPUT OF EDUCATIONAL PSYCHOLOGY DATA BANK[1]

Course	Semester	Year	Variables	Output Available
105	Second	67-68	1. Test Scores 2. Aptitude	1. Frequency % distribution for variables 2. Intercorrelations
105	First	68-69	1. Test Scores 2. Aptitude 3. Lab Participation	1. Same as above
105 (general)	Second	68-69	1. Test Scores 2. Aptitude 3. Lab Participation 4. Demographic 5. Achievement 6. Involvement in Course Work 105 and others	1 - 2 Same as above
105 (control-experimental)	Second	68-69	1. Test Scores 2. Aptitude 3. Demographic	1 - 2 Same as above

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[1] As appearing in Educational Psychology Data Bank, Report #1 by Walls and Carter.

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APPENDIX C

SUMMARY OF DATA

Student Reactions to Slide-Tape Program Series

Educational Psychology 105

Summer 1970

The Learning Center

College of Human Resources & Education

BRIEF OUTLINE OF CONTENT:
EDUCATIONAL PSYCHOLOGY SLIDE-TAPE SERIES
WEST VIRGINIA UNIVERSITY

1. HOW AFFECTIVE TEACHING GOALS RELATE TO SPECIFIC BEHAVIORAL OBJECTIVES

2. WHAT IS A TAXONOMY OF EDUCATIONAL OBJECTIVES?

This program deals with an explanation of a classification system in relation to the cognitive levels of behavioral objectives.

3. WRITING BEHAVIORAL OBJECTIVES AT DIFFERENT COGNITIVE LEVELS

This program considers each of the levels of cognition, defines and gives examples of each. Explore use of Bloom's Taxonomy in writing behavioral objectives at all levels of cognition.

4. INTRODUCTION TO MEASUREMENT

This program explains how to evaluate the effectiveness of the instructional process and to derive guidance for changing the curriculum.

5. THE EVOLUTION OF BEHAVIORAL MEASUREMENTS

This program gives the definition, characteristics, and best uses of the three types of measures: individual referenced, norm referenced, and criterion referenced. An explanation of the reasons for a recommended shift in emphasis on use of norm referenced measures to use of criterion referenced measures in schools.

6. WRITING TEST ITEMS AT VARIOUS COGNITIVE LEVELS

This program relates the instructional material to the type of testing being used. The cognitive level of testing must be equal to the cognitive level of the objectives in order to evaluate the degree of attainment of the objectives.

7. CHOOSING SPECIFIC TYPES OF TEST ITEMS

This program helps the student to determine what type of test item is appropriate for the evaluation of the attainment of a specific behavioral objective.

8. TWO KINDS OF LEARNING

This program explains the two basic kinds of learning: operant and respondant. The program explores the significance of each type of learning in the instructional process.

9. BEHAVIOR, SHAPING, PLUS AN INTRODUCTION TO GENERALIZATION AND DISCRIMINATION

This program explains the art of shaping behavioral patterns of the student and illustrates these methods through examples. Generalization and discrimination are defined and examples of each are given.

10. GENERALIZATION AND DISCRIMINATION

This program explains how concepts are formed and gives detailed study of two important processes involved in concept development: generalization and discrimination.

11. MOTIVATION FOR LEARNING

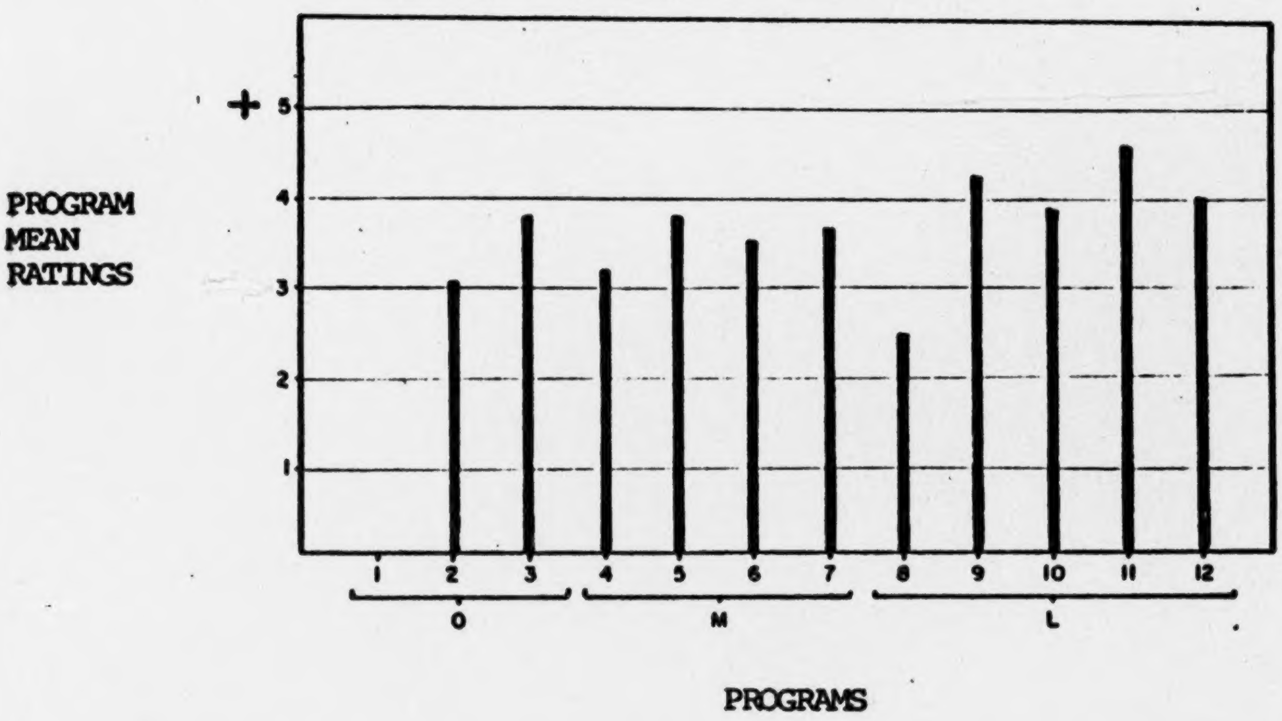
This program illustrates ways to contrive learning situations which the students will find relevant to their needs, and therefore, meaningful to them.

12. PUNISHMENT USED FOR THE CONTROL OF BEHAVIOR

This program aids the teacher in controlling bad behavior. There is an explanation of the psychological harm which can derive from an over-emphasis on the use of punishment in controlling behavior.

I. COMPARISONS OF THE PROGRAMS

EFFECTIVENESS OF PROGRAM IN HELPING STUDENT LEARN



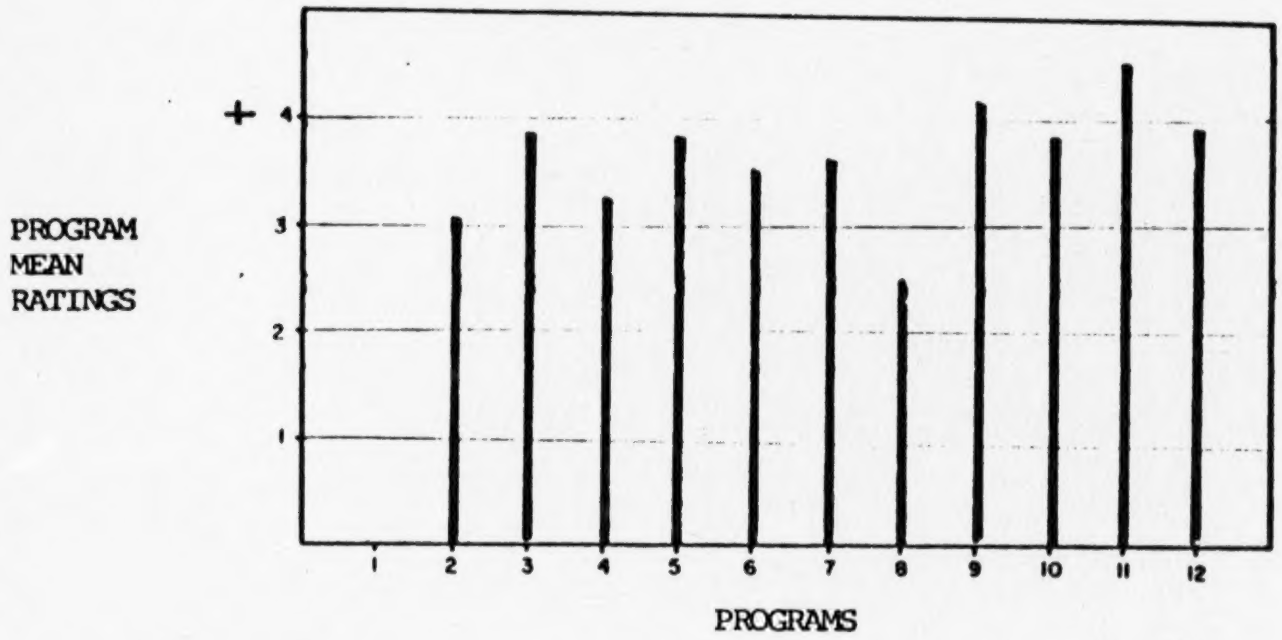
KEY:

1. POOR OR INNEFFECTIVE
2. BELOW AVERAGE
3. AVERAGE
4. ABOVE AVERAGE
5. EXCELLENT

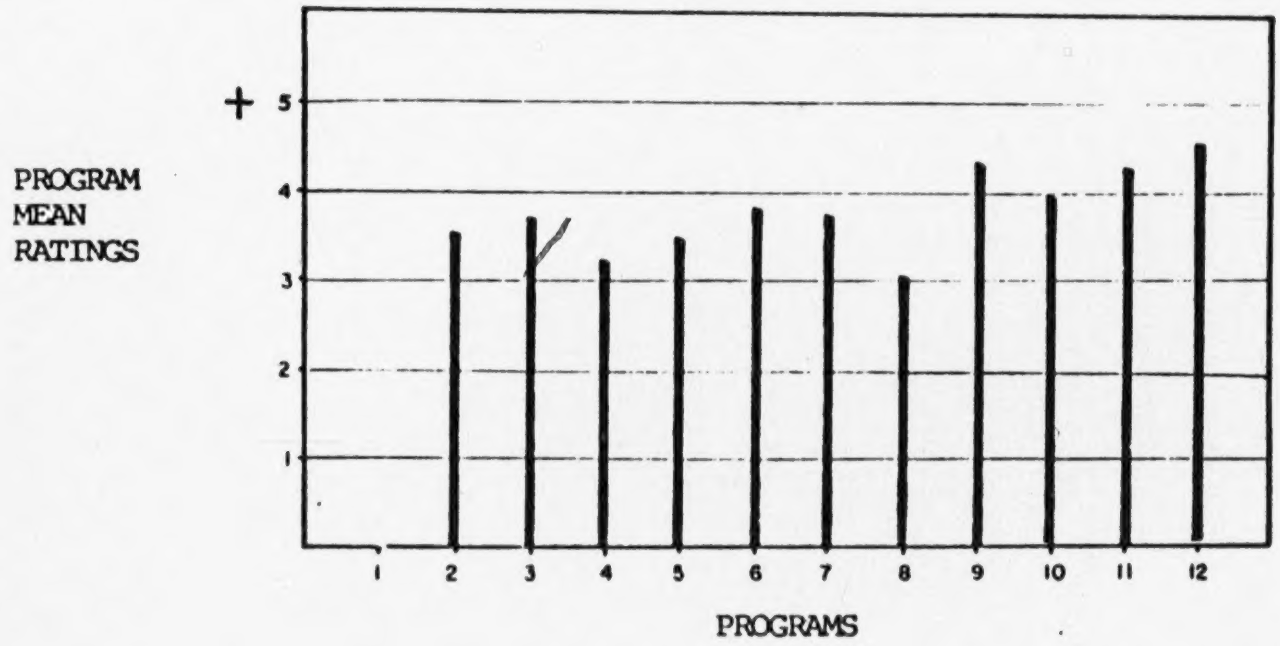
KEY:

1. ALMOST USELESS
2. A LITTLE HELPFUL
3. SOME HELP
4. VERY HELPFUL

HELPFULNESS OF RESPONSE SHEET



GENERAL OPINION OF THIS PARTICULAR PROGRAM



KEY:

1. POOR
2. BELOW AVERAGE
3. AVERAGE
4. GOOD
5. EXCELLENT

II. RESPONSE TO QUESTION:

Do you like learning from programs of this type?

YES	86%
NO	4%
(INDIFFERENT) It's About As Good As Lectures	10%

III. Indication of the one most important use of the response sheets.

50% Reinforce important points for efficient learning.

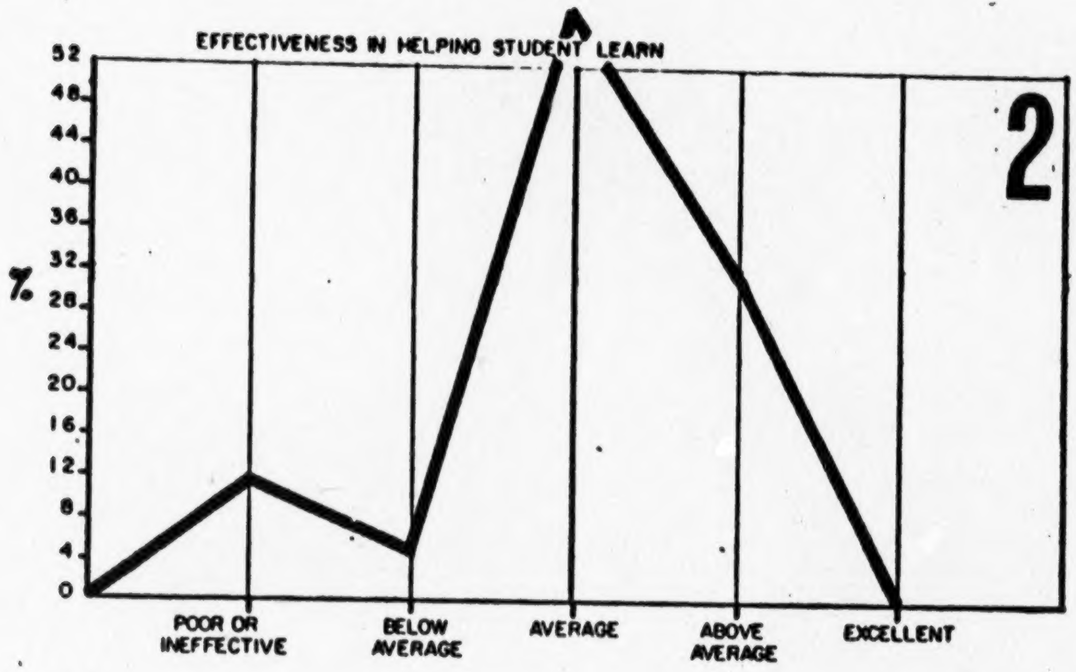
11% Identifies points which are relatively more important to course designers.

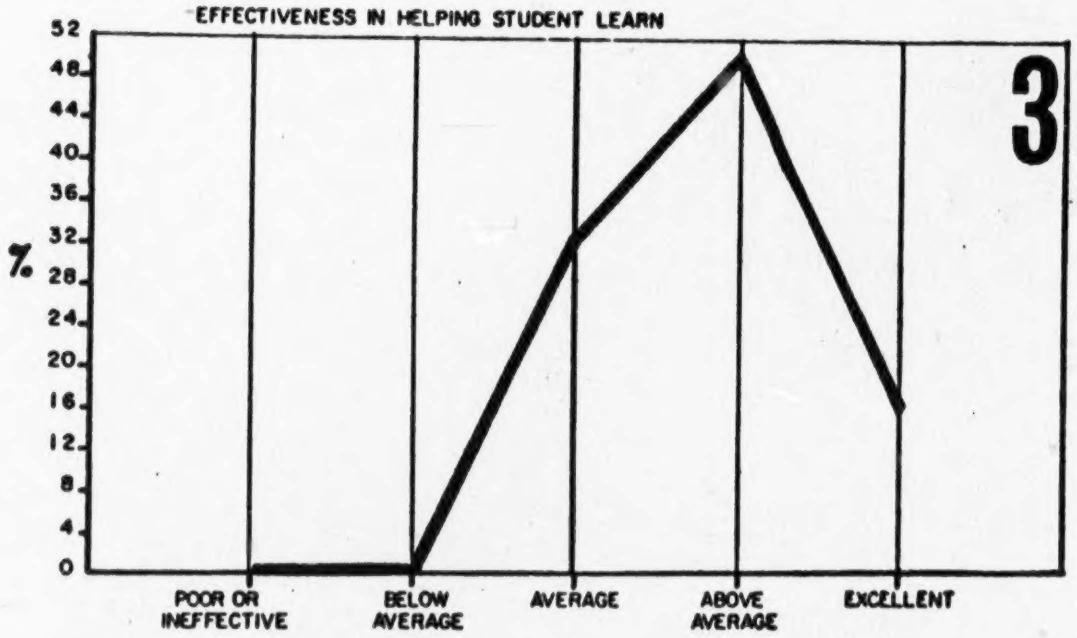
39% Useful for later study and review.

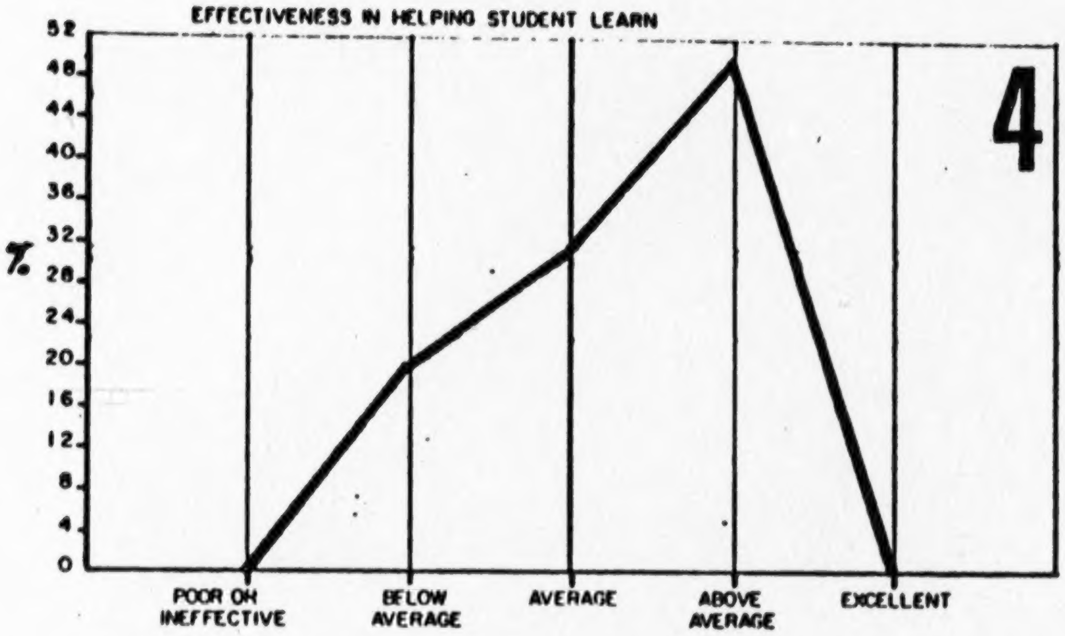
1/2% Other (specified by students).

IV. In general, how effective was this program in helping you learn?

- reported for programs 2 - 12 in the following series of charts.






EFFECTIVENESS IN HELPING STUDENT LEARN
4
%
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48
44
40
36
32
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4
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POOR OR INEFFECTIVE
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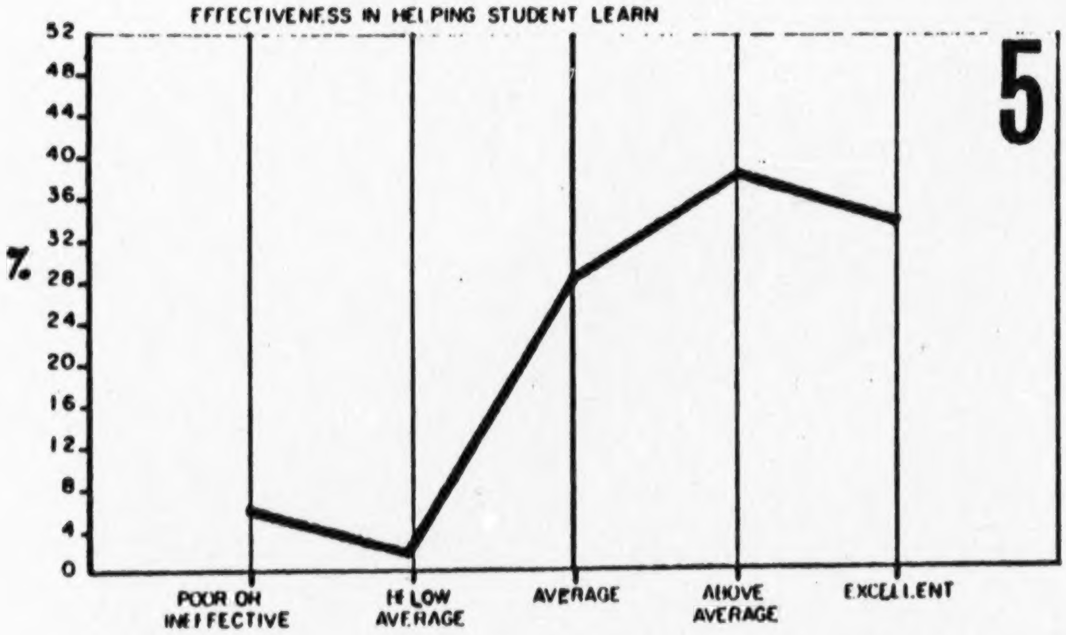
AVERAGE
ABOVE AVERAGE
EXCELLENT


EFFECTIVENESS IN HELPING STUDENT LEARN
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POOR OR INEFFECTIVE
BELOW AVERAGE
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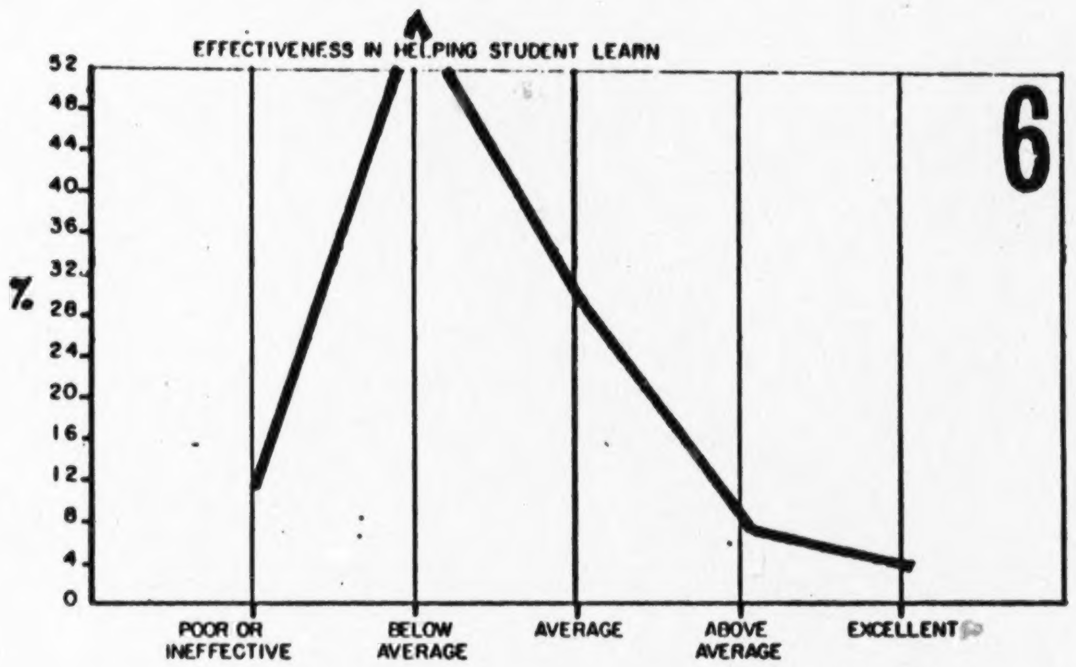
ABOVE AVERAGE
EXCELLENT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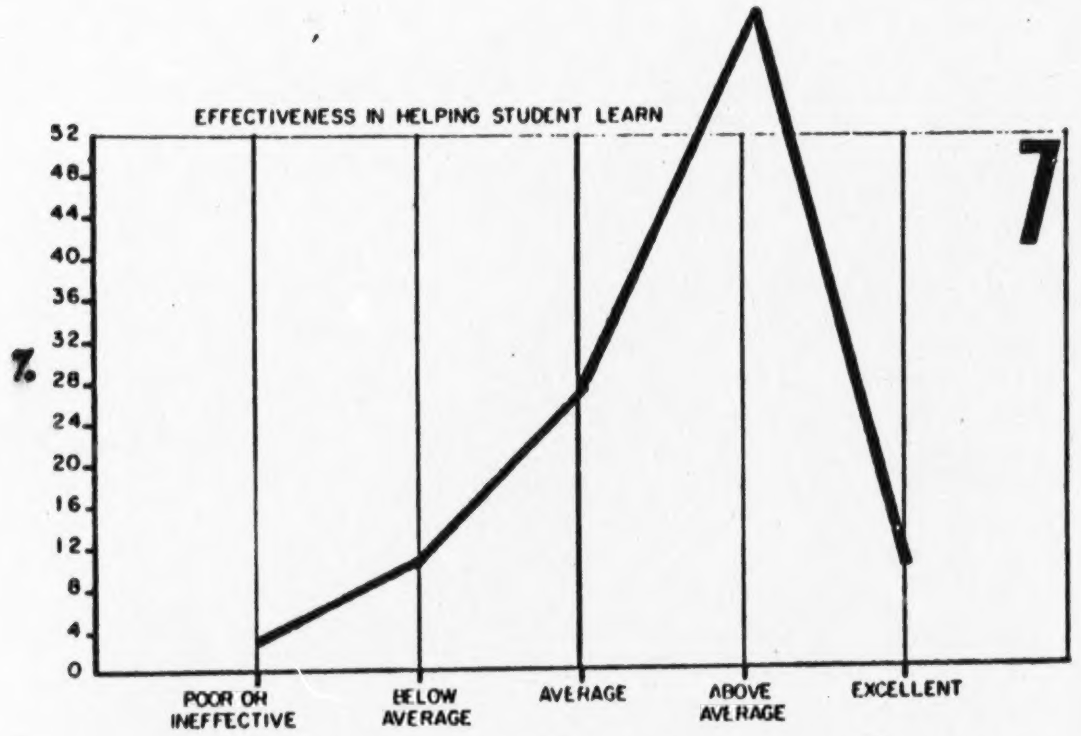
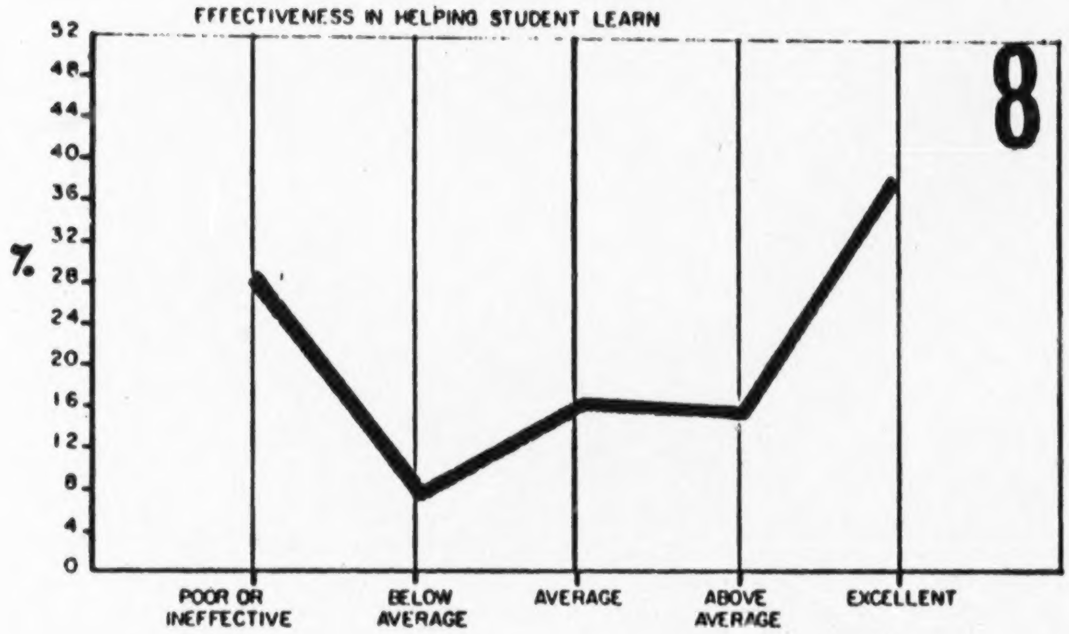
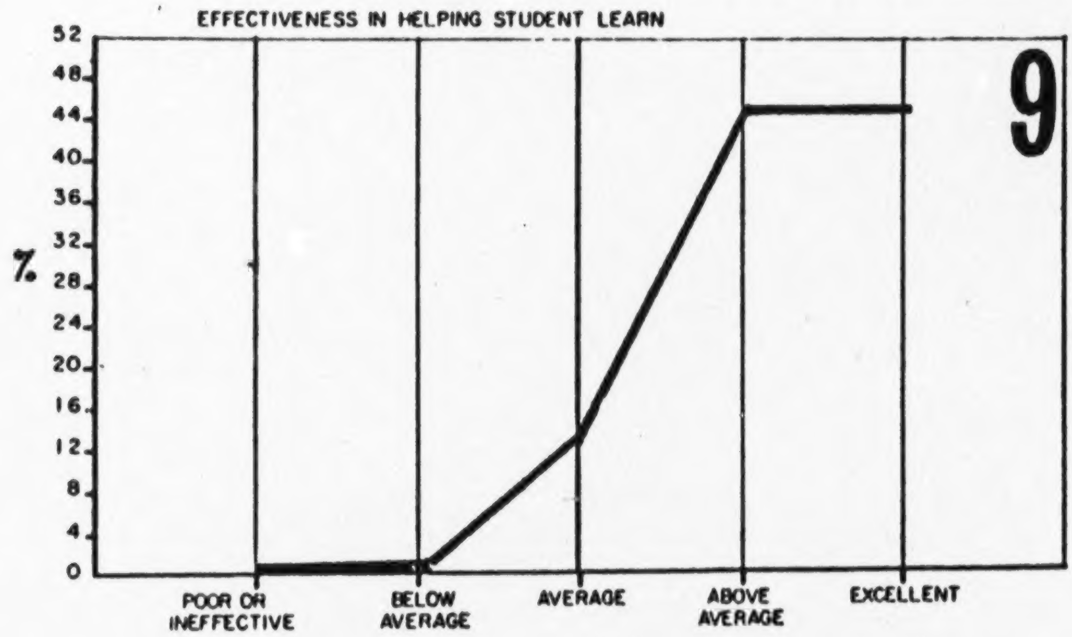
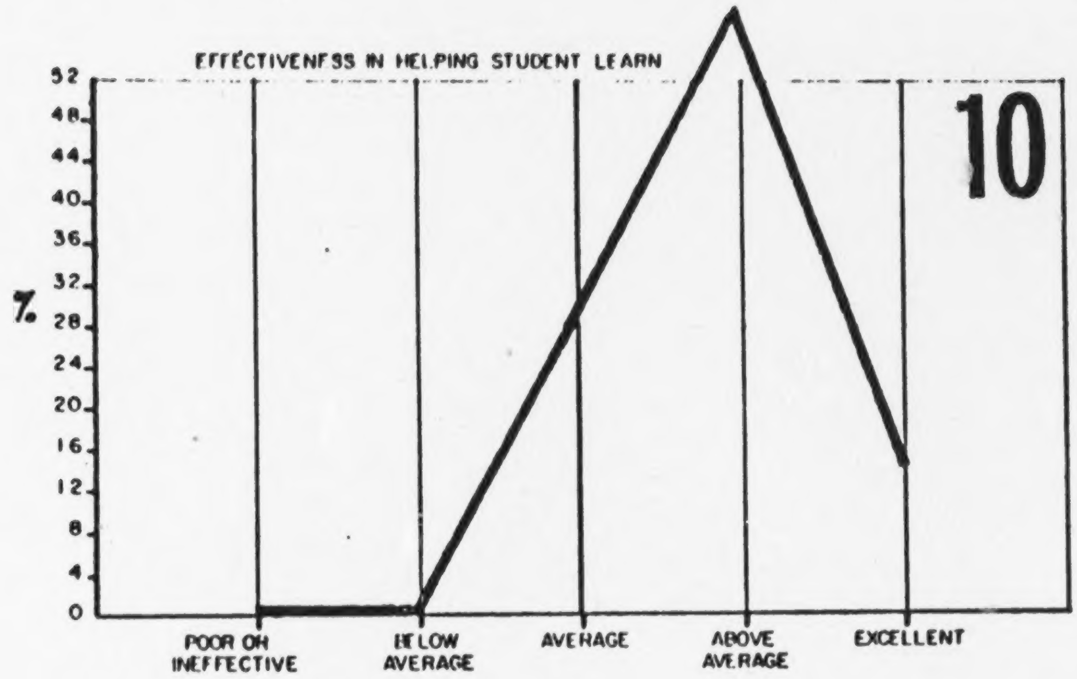
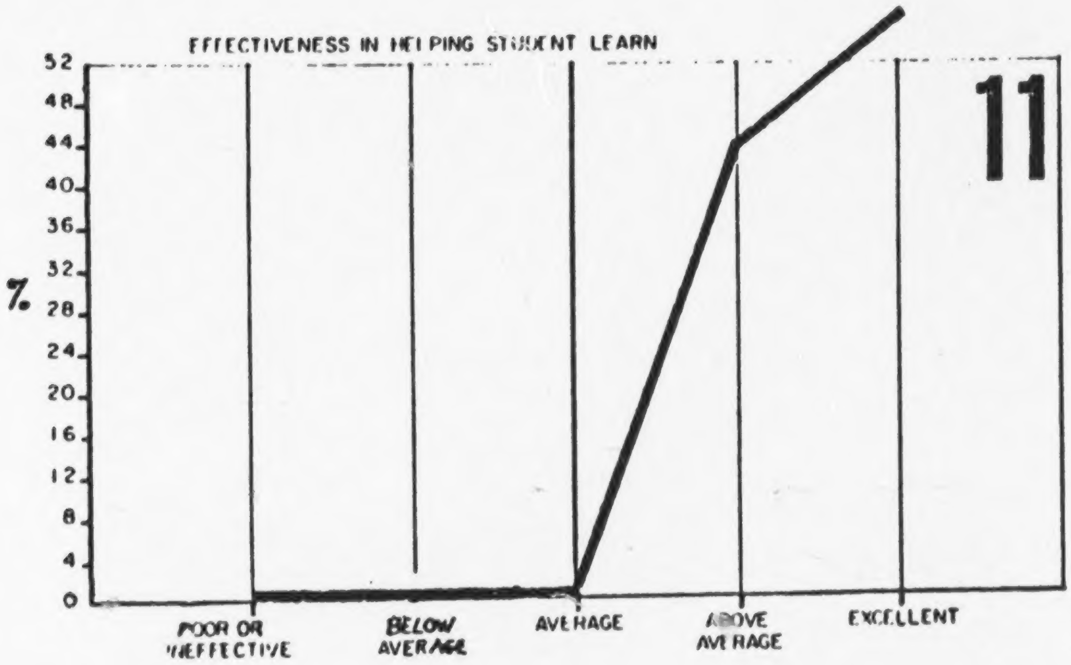
POOR OR INEFFECTIVE
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
EXCELLENT

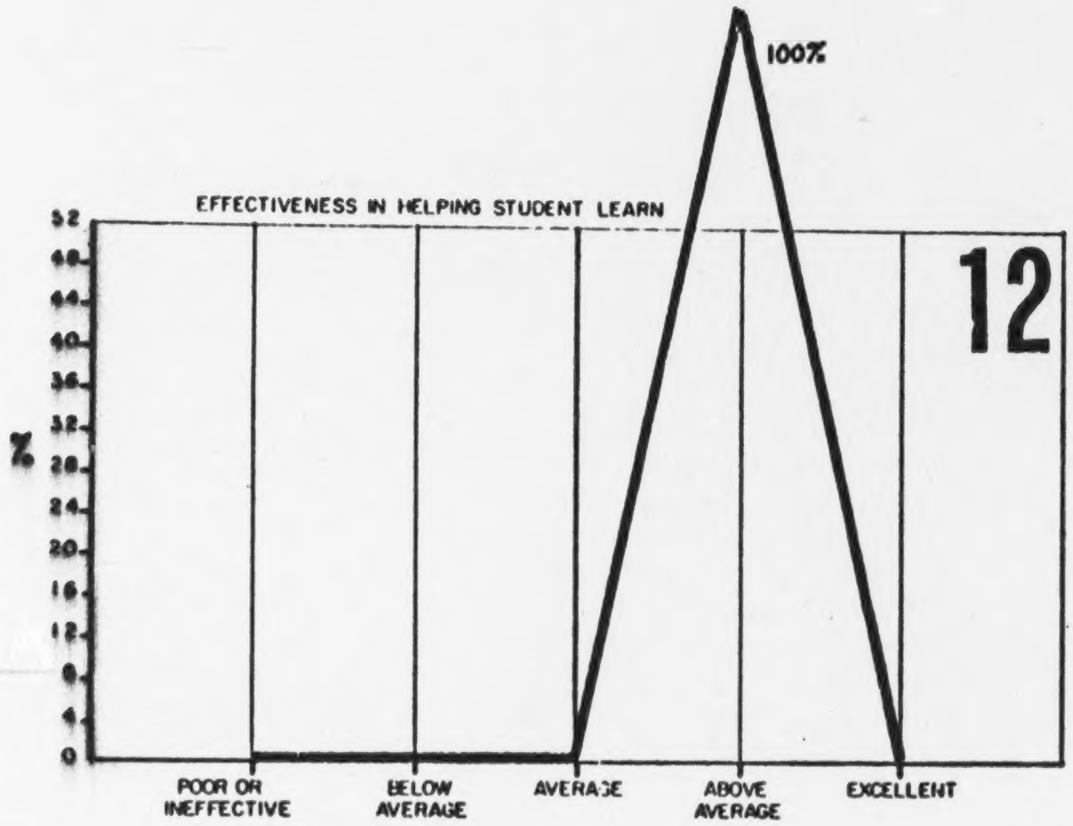

EFFECTIVENESS IN HELPING STUDENT LEARN
7
%
52
48
44
40
36
32
28
24
20
16
12
8
4
0
POOR OR INEFFECTIVE
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
EXCELLENT


EFFECTIVENESS IN HELPING STUDENT LEARN
8
%
52
48
44
40
36
32
28
24
20
16
12
8
4
0
POOR OR INEFFECTIVE
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
EXCELLENT


EFFECTIVENESS IN HELPING STUDENT LEARN
9
%
52
48
44
40
36
32
28
24
20
16
12
8
4
0
POOR OR INEFFECTIVE
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
EXCELLENT


EFFECTIVENESS IN HELPING STUDENT LEARN
10
%
52
48
44
40
36
32
28
24
20
16
12
8
4
0
POOR OR INEFFECTIVE
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
EXCELLENT


EFFECTIVENESS IN HELPING STUDENT LEARN
11
%
52
48
44
40
36
32
28
24
20
16
12
8
4
0
POOR OR INEFFECTIVE
BELOW AVERAGE
AVERAGE
ABOVE AVERAGE
EXCELLENT



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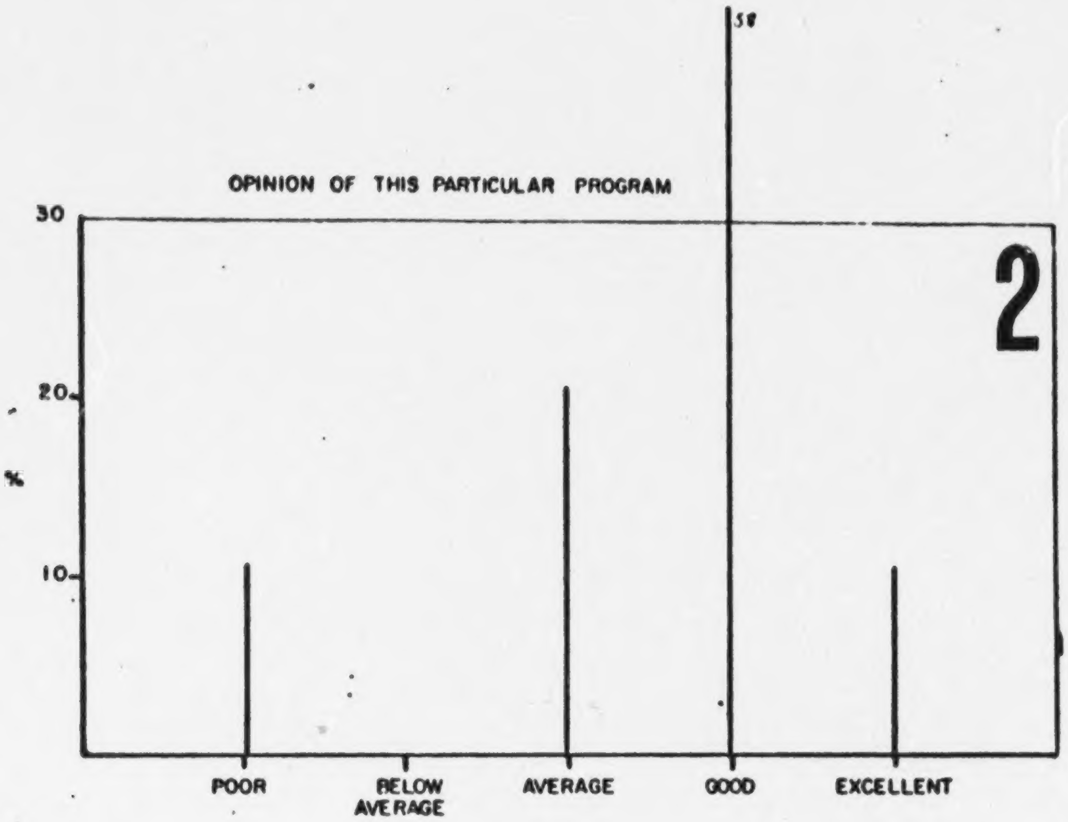
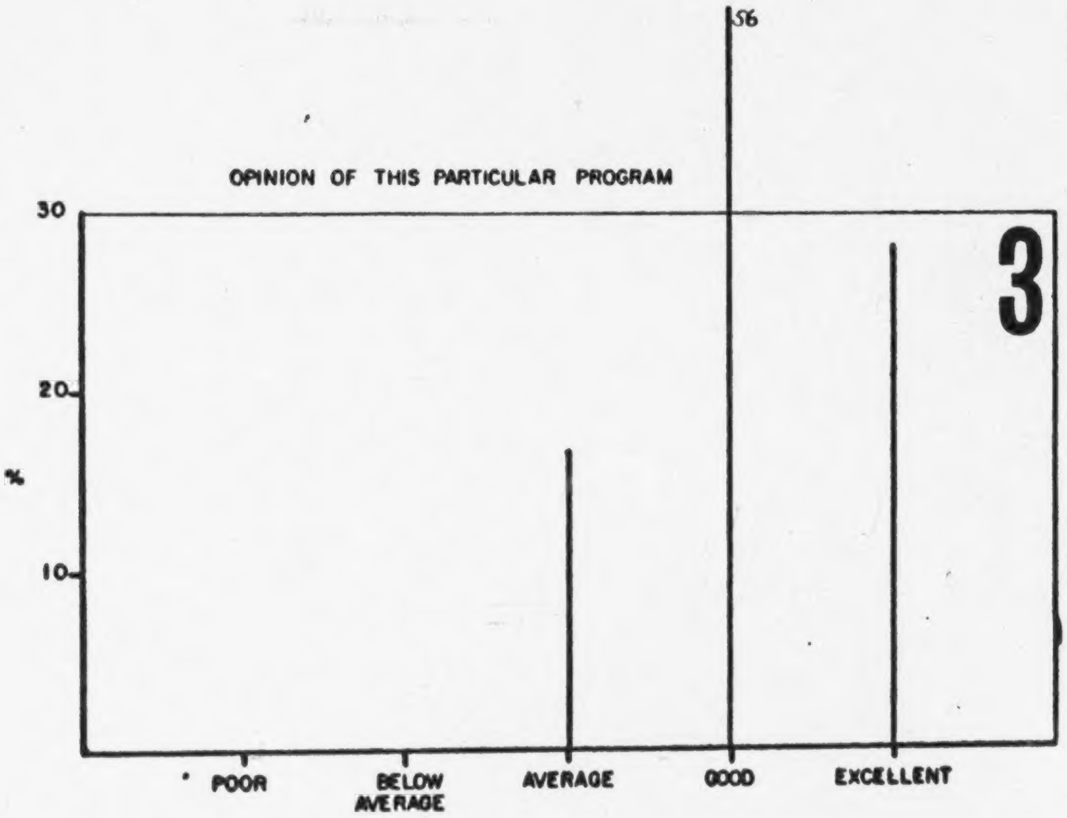
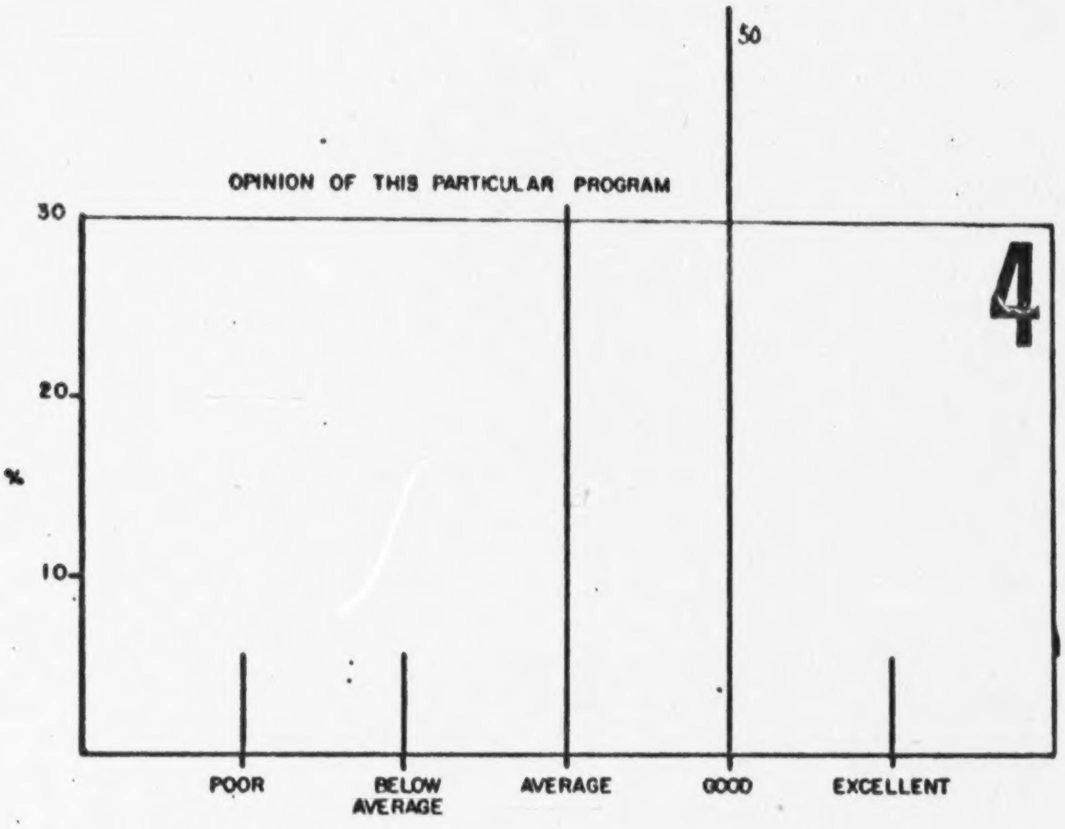
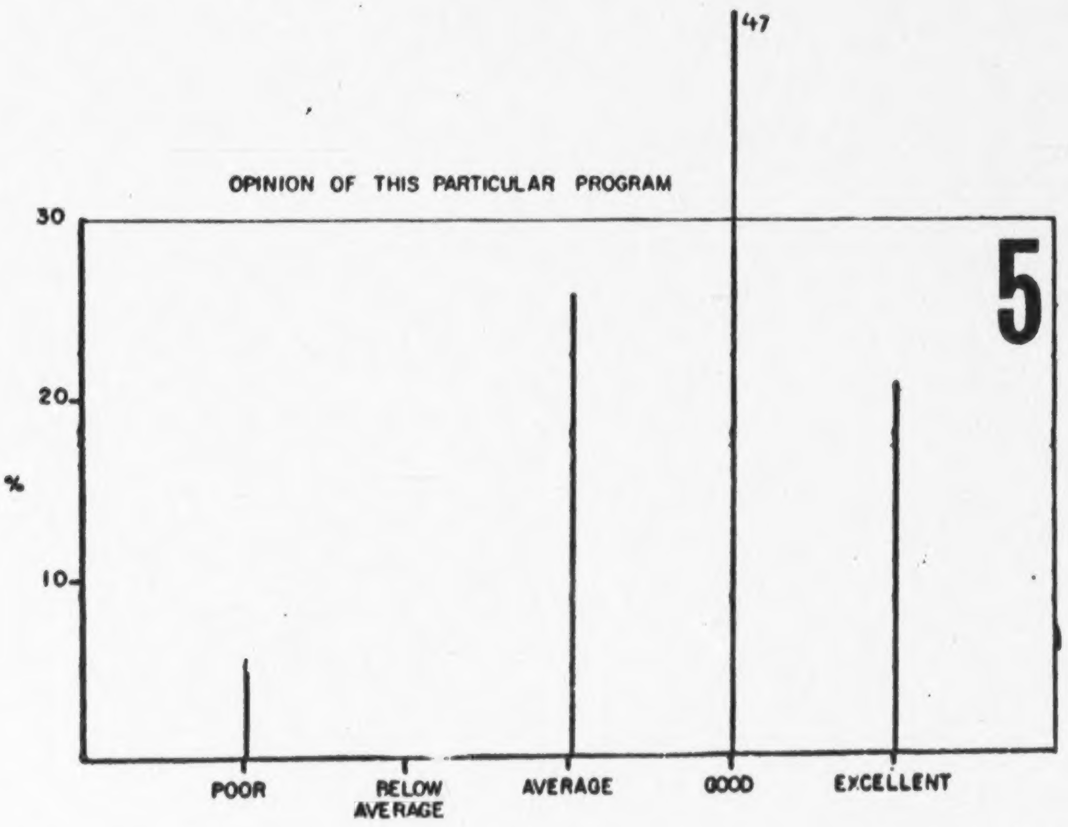
V. As programs go, what is your general opinion of this particular program?

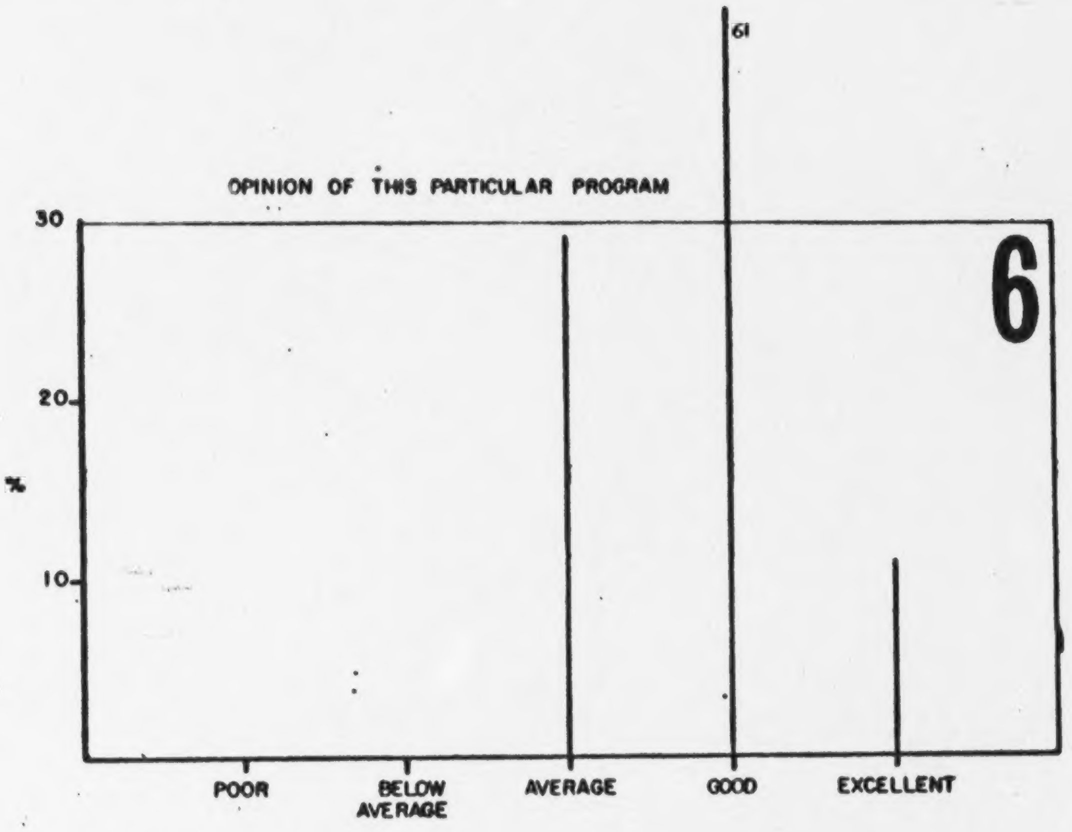
- reported for programs 2 - 12 on the following series of charts.





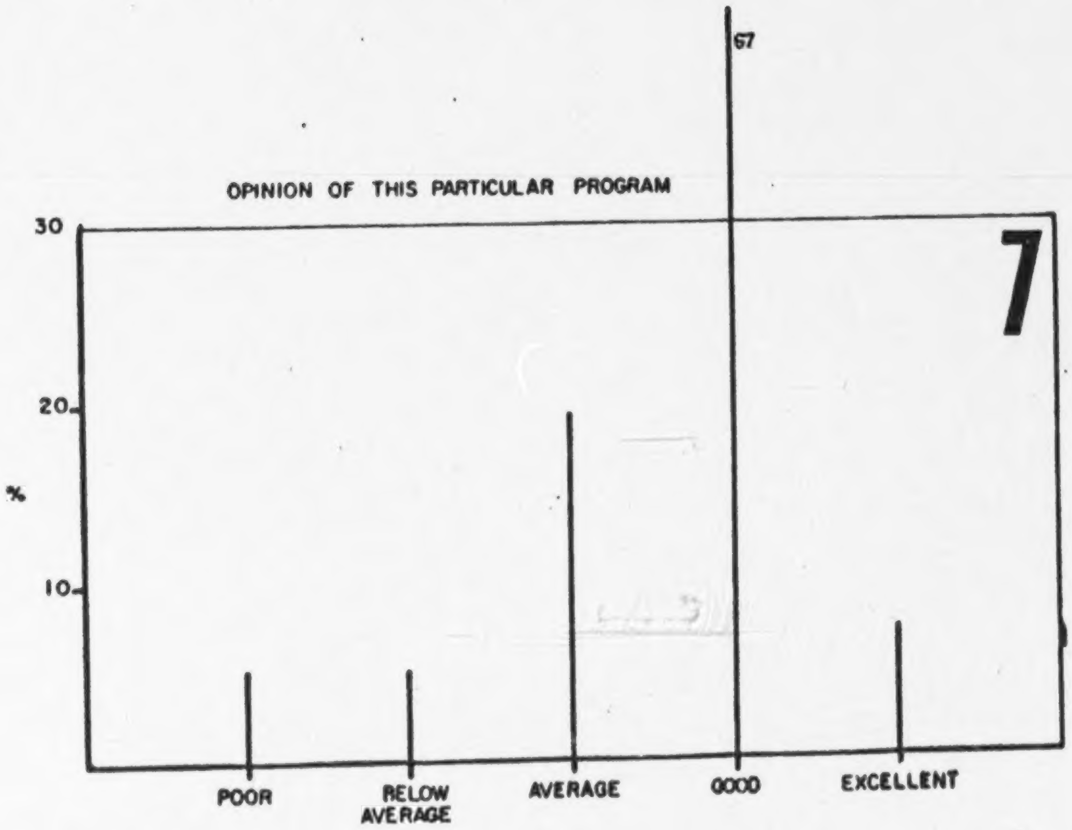

50
OPINION OF THIS PARTICULAR PROGRAM
30
20
%
10
4
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT


47
OPINION OF THIS PARTICULAR PROGRAM
30
20
%
10
5
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT



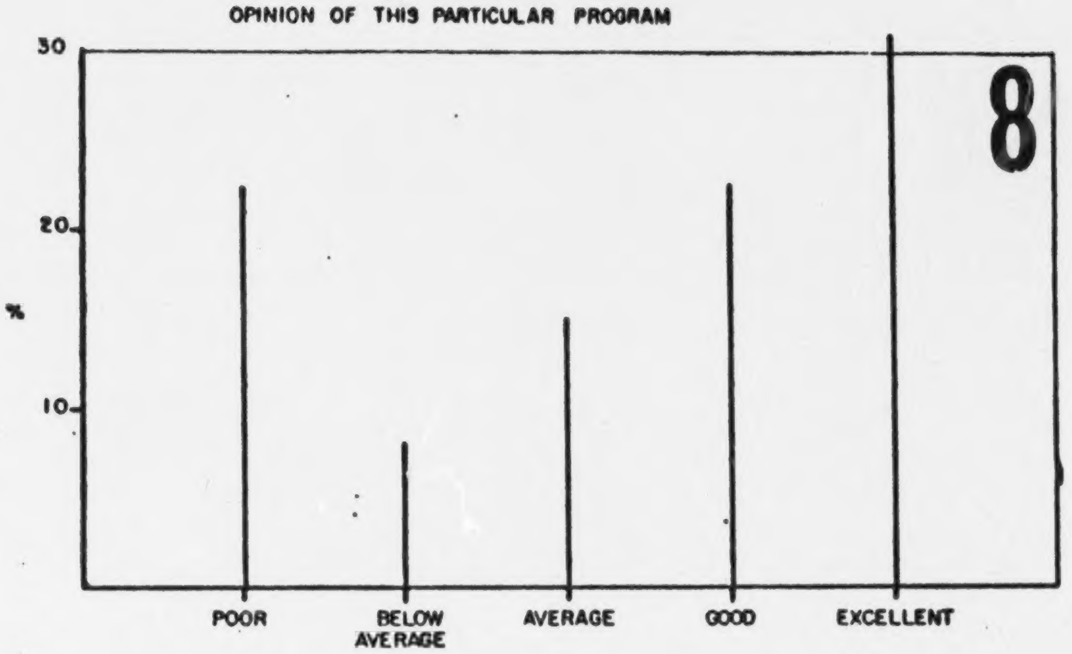
6

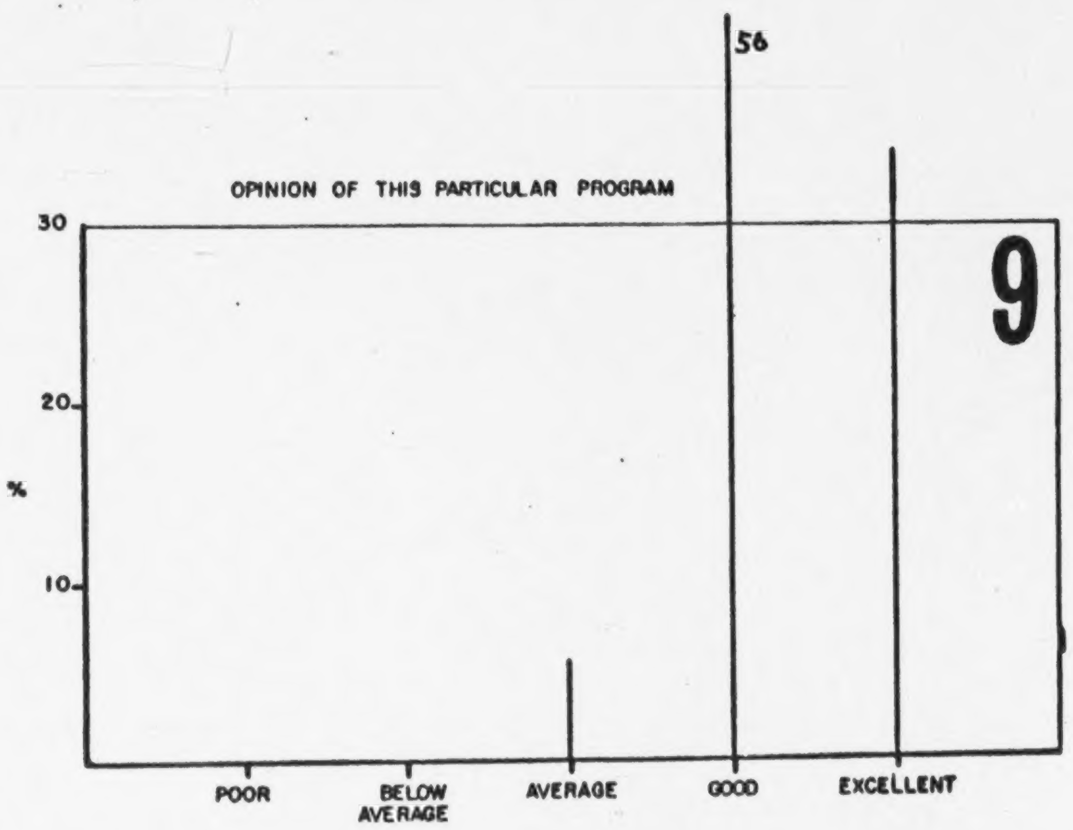
OPINION OF THIS PARTICULAR PROGRAM
30
20
10
%
61
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT

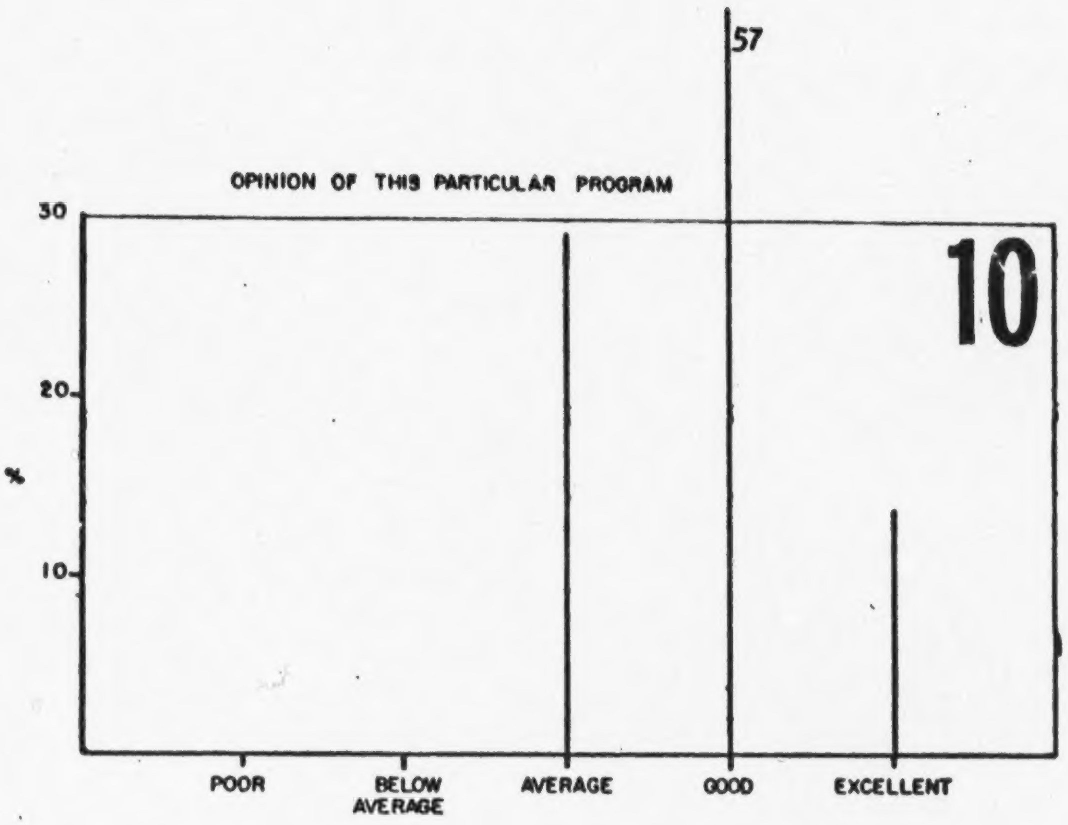


7

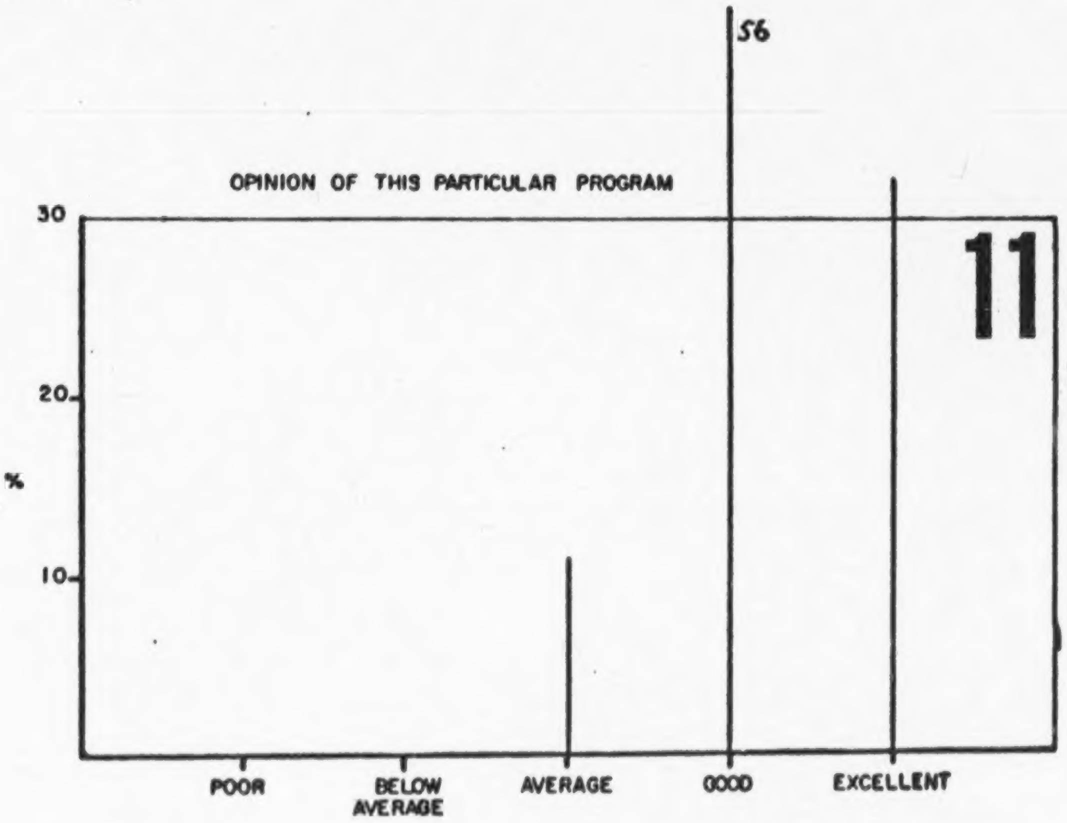
OPINION OF THIS PARTICULAR PROGRAM
30
20
10
%
67
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT


OPINION OF THIS PARTICULAR PROGRAM
8
30
20
%
10
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT


56
OPINION OF THIS PARTICULAR PROGRAM
9
30
20
%
10
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT


57
OPINION OF THIS PARTICULAR PROGRAM
30
20
%
10
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT

10

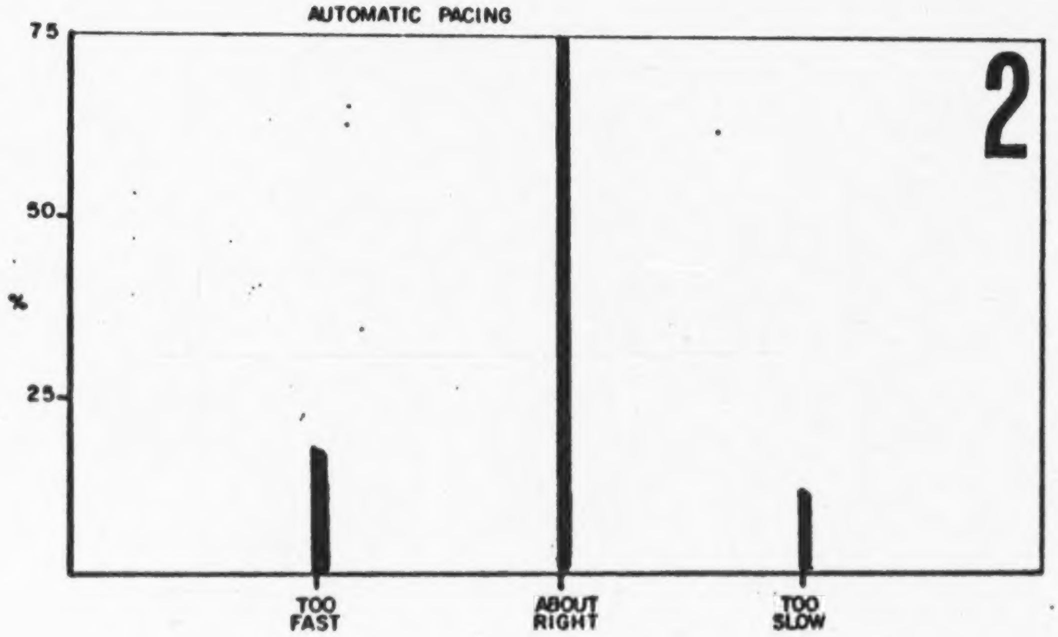

56
OPINION OF THIS PARTICULAR PROGRAM
30
20
%
10
POOR
BELOW AVERAGE
AVERAGE
GOOD
EXCELLENT

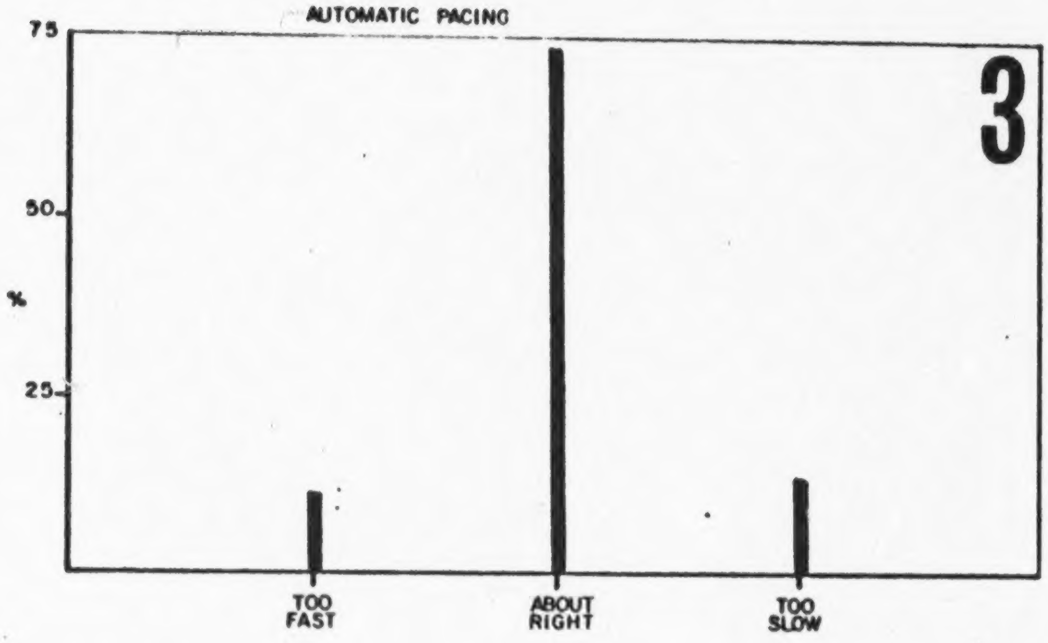
11

VI. Responses to the question:

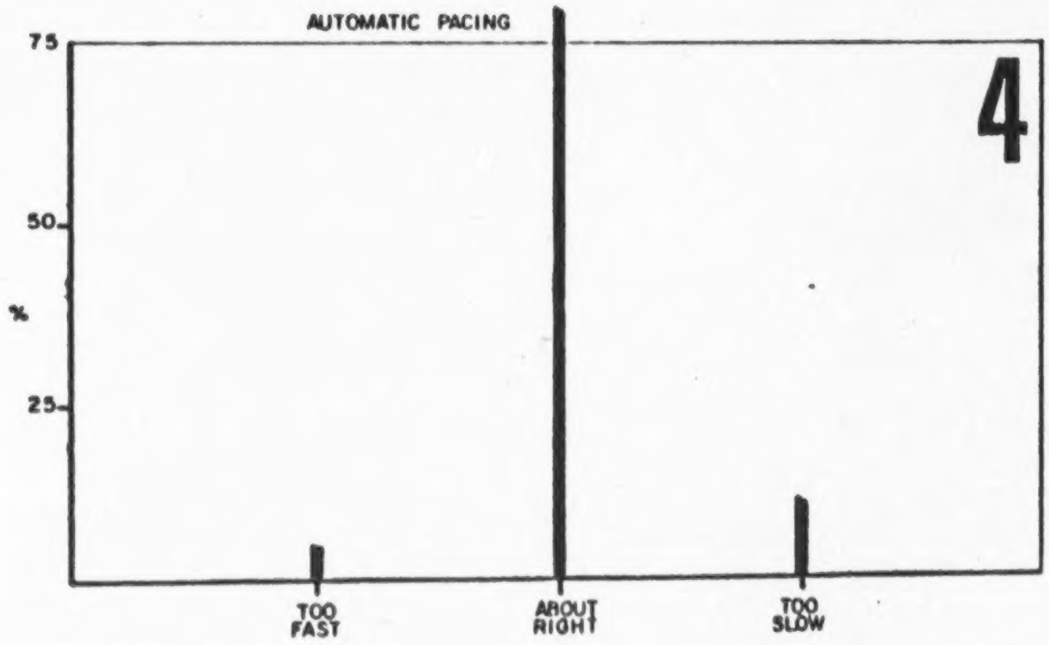
HOW WAS THE PROGRAM PACED?

- reported for programs 2 - 12 on the following series of charts.

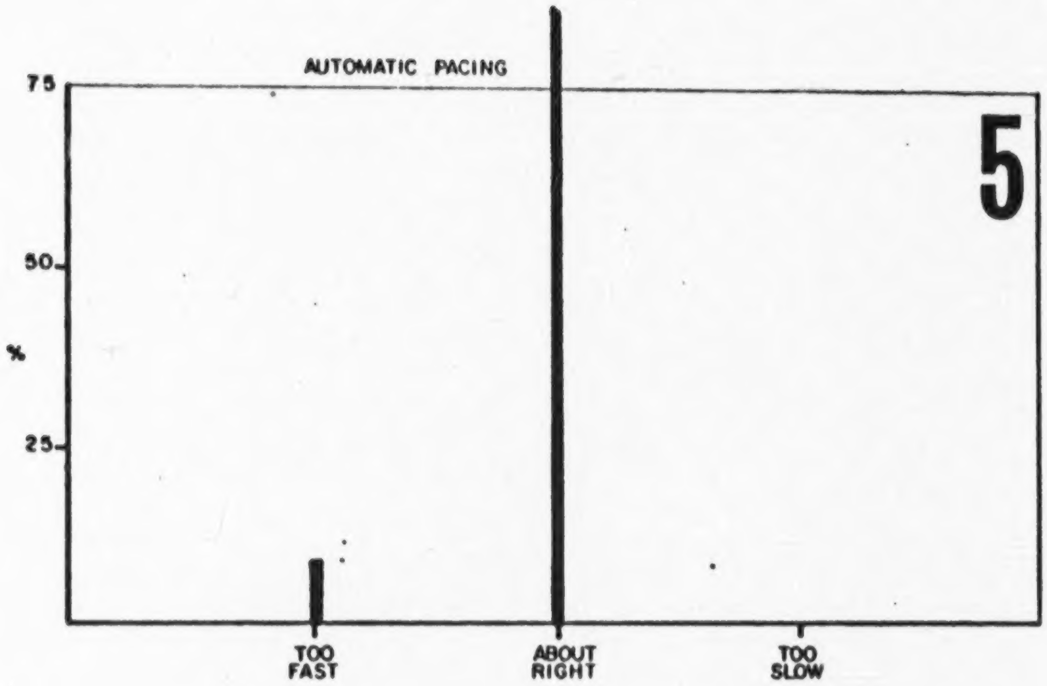


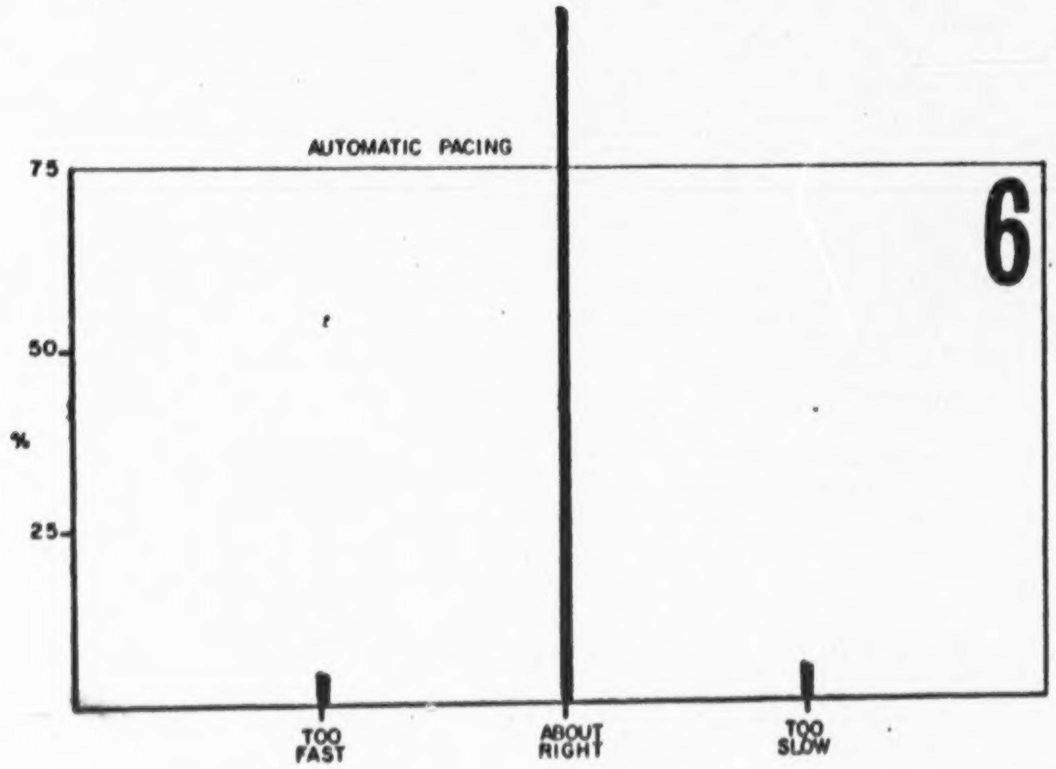

AUTOMATIC PACING
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW

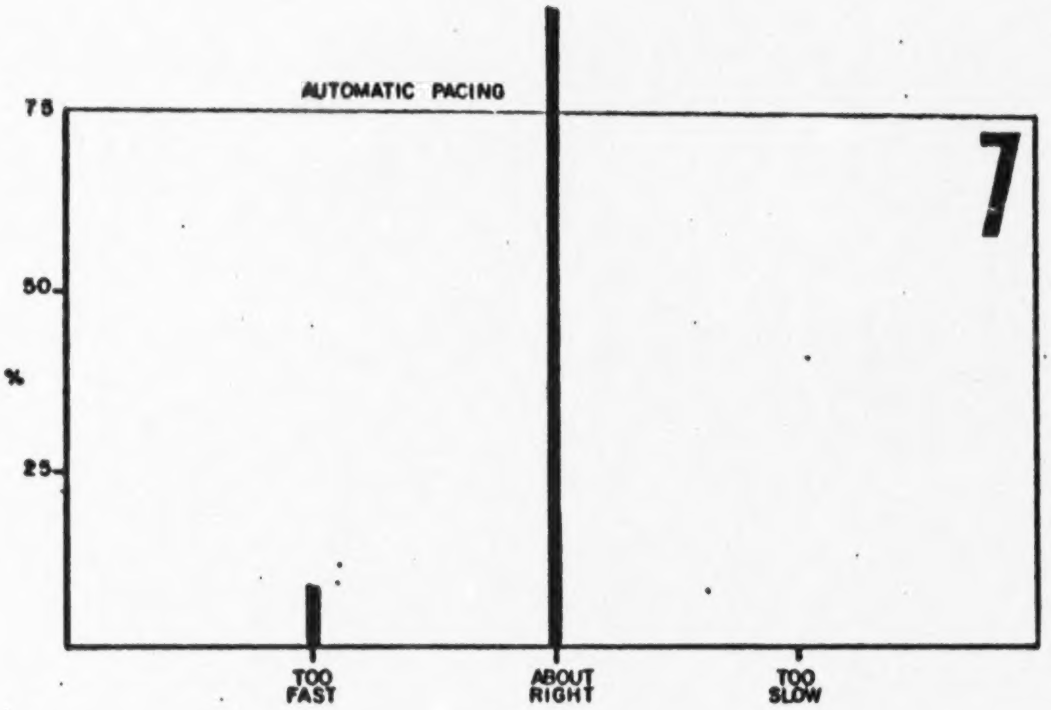
3

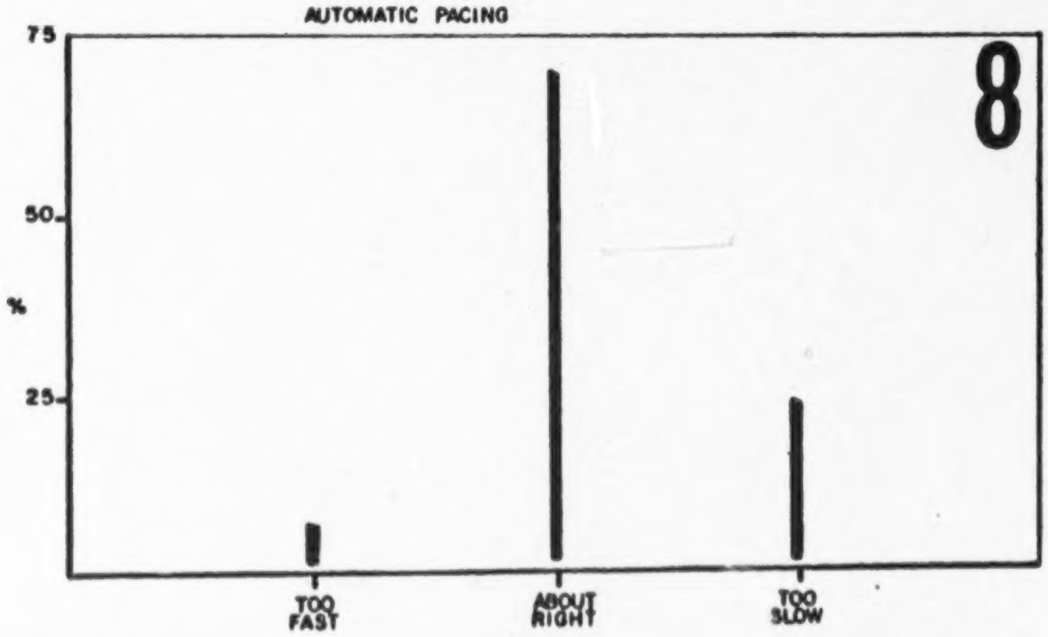

AUTOMATIC PACING
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW

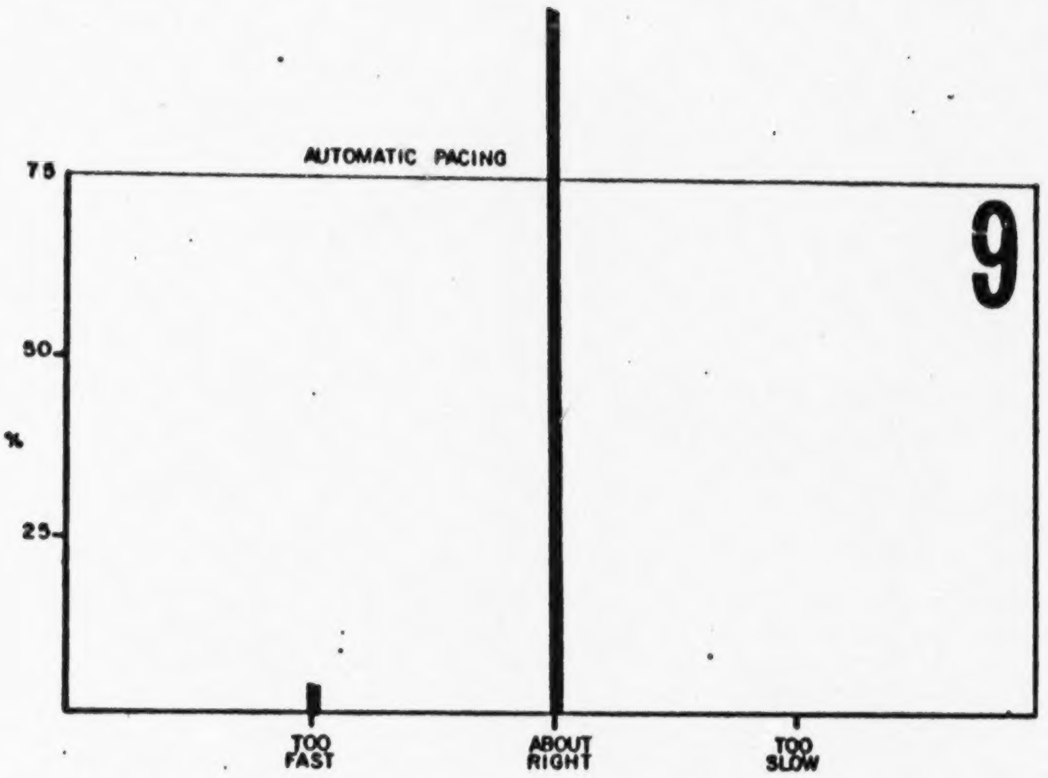
4

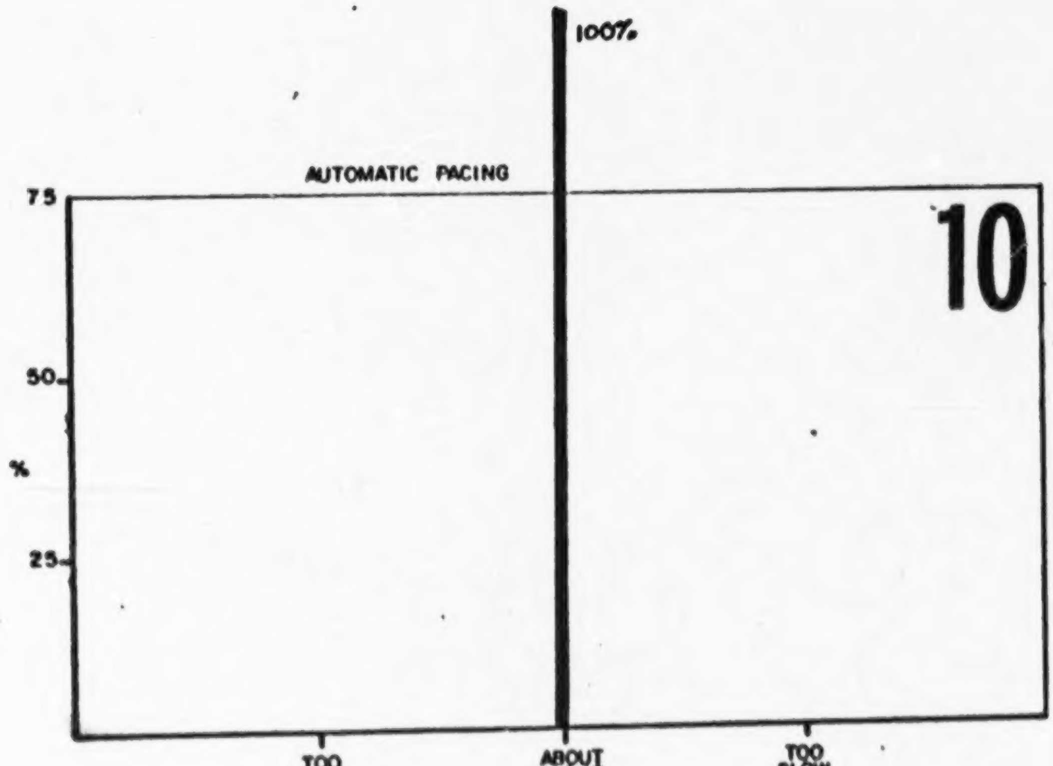

AUTOMATIC PACING
5
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW

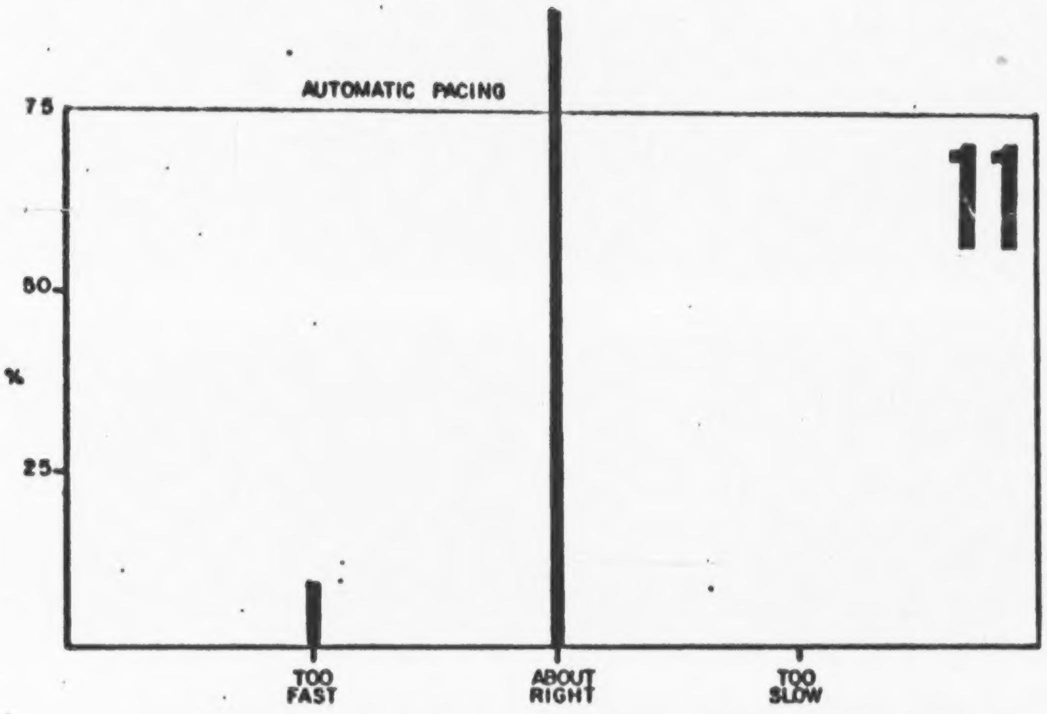

AUTOMATIC PACING
6
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW

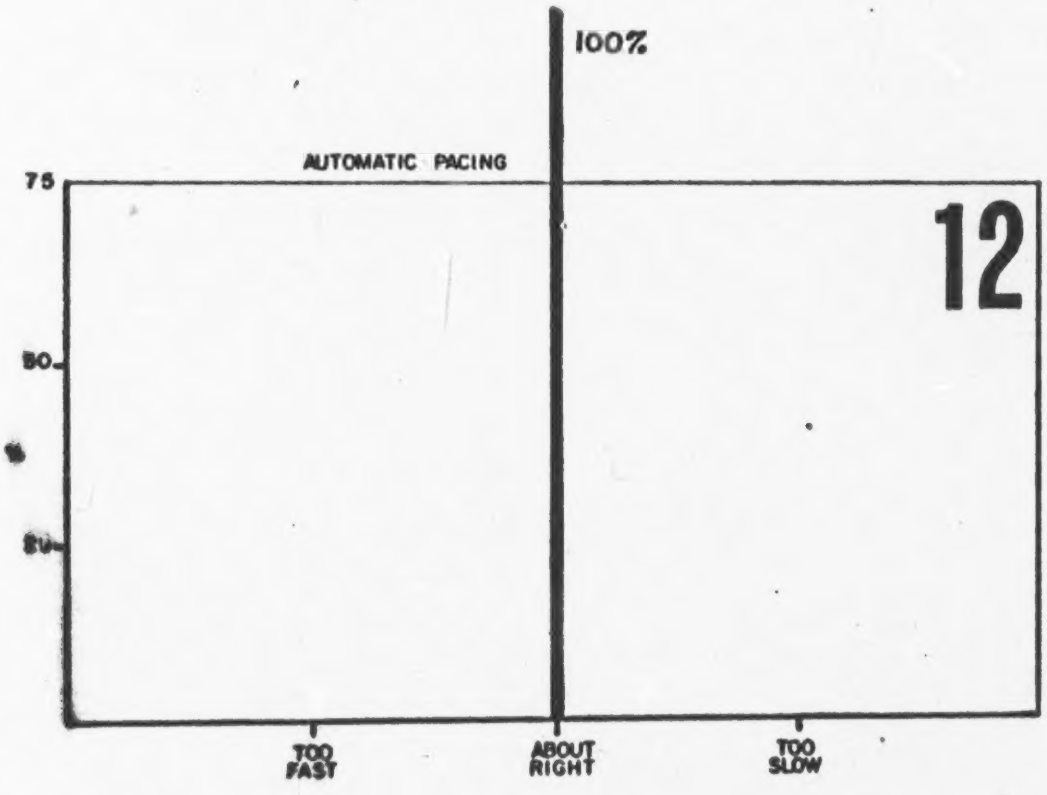

7
AUTOMATIC PACING
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW


8
AUTOMATIC PACING
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW


AUTOMATIC PACING
9
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW

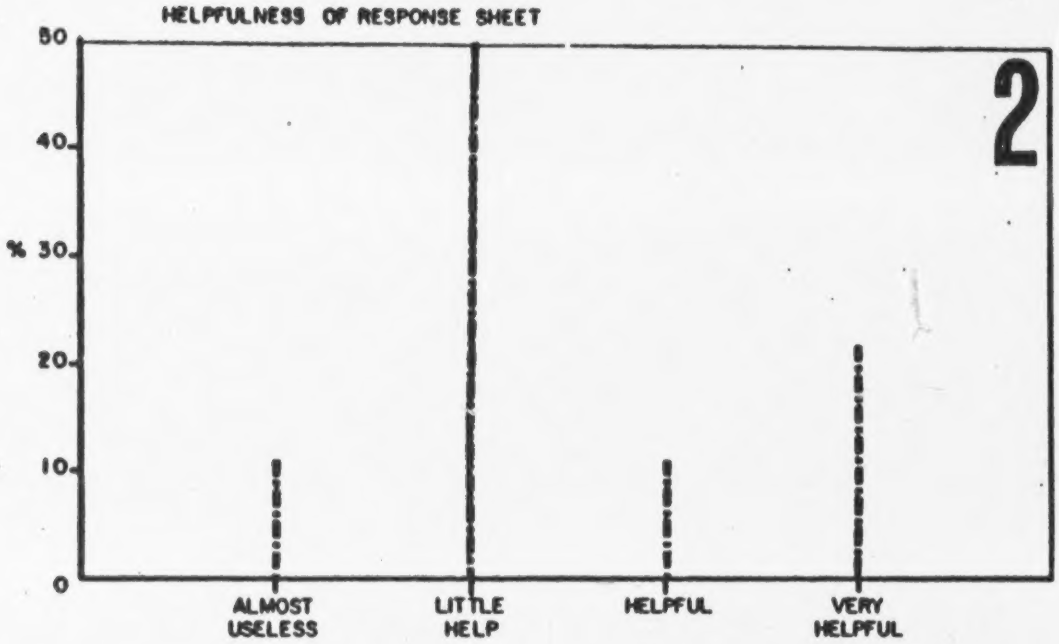

100%
AUTOMATIC PACING
10
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW

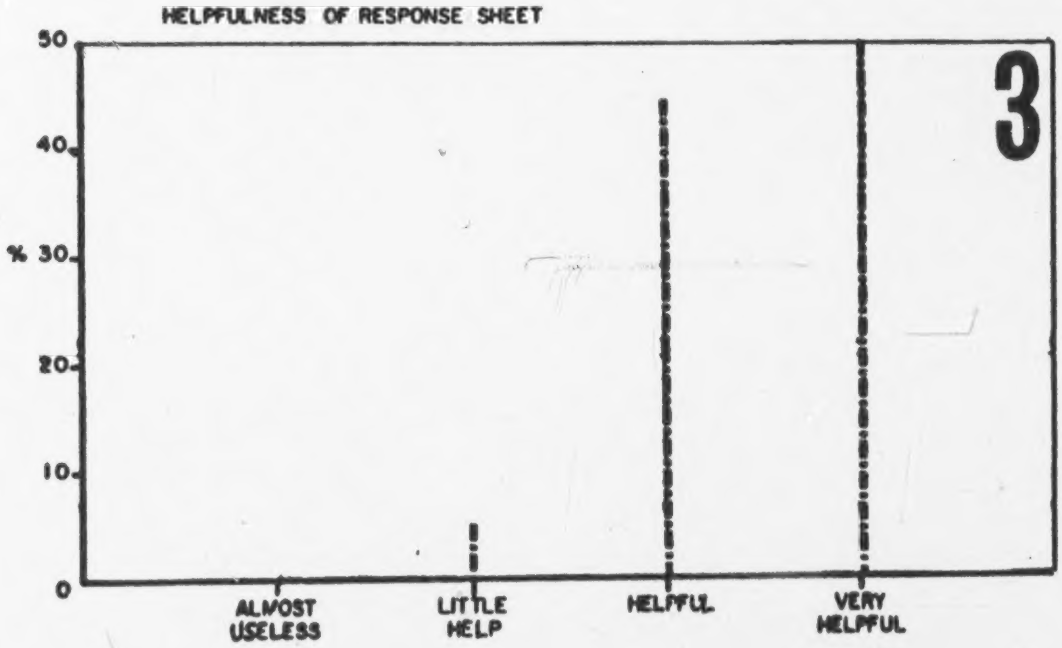

AUTOMATIC PACING
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW
11

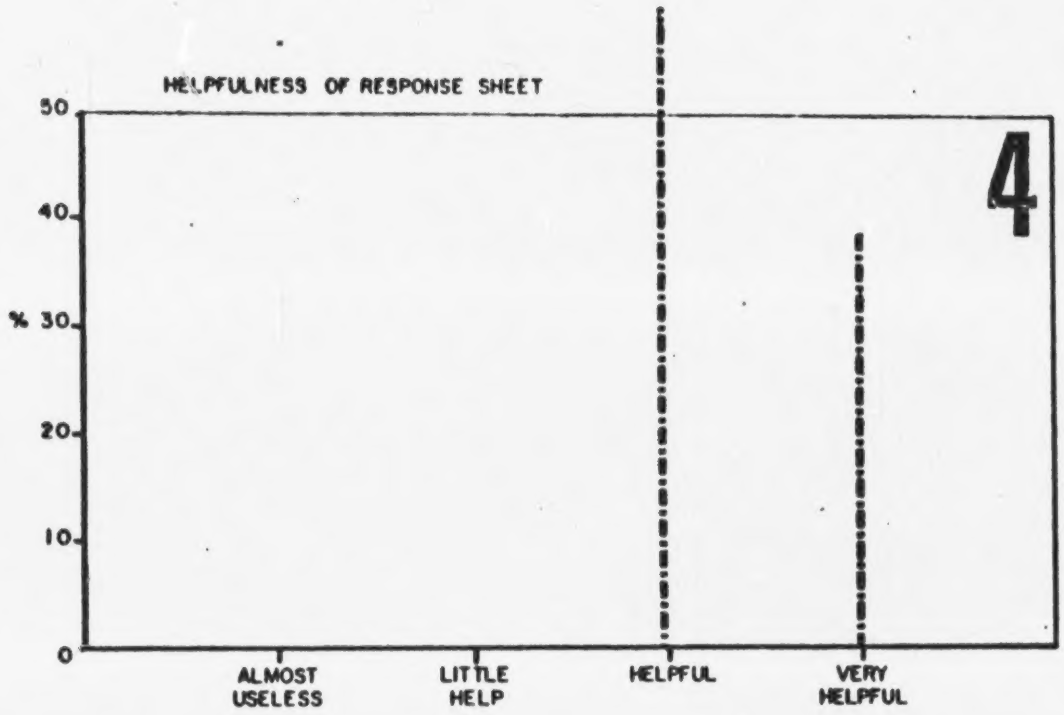

100%
AUTOMATIC PACING
75
50
%
25
TOO FAST
ABOUT RIGHT
TOO SLOW
12

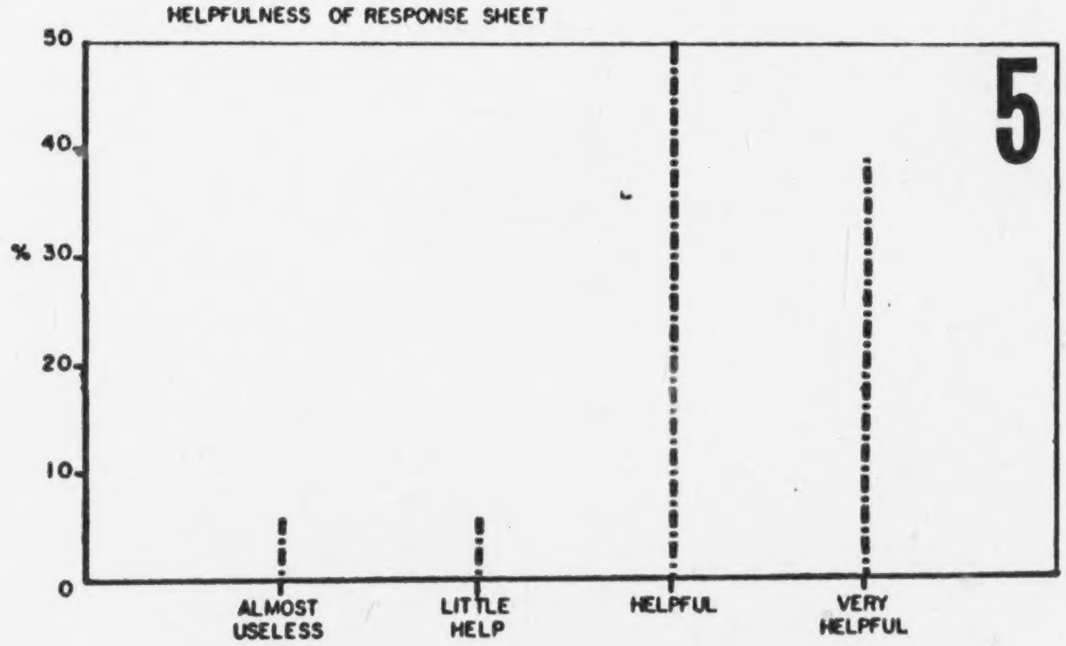
VII. If the program has a response sheet, how much did the response sheet help you learn the material?

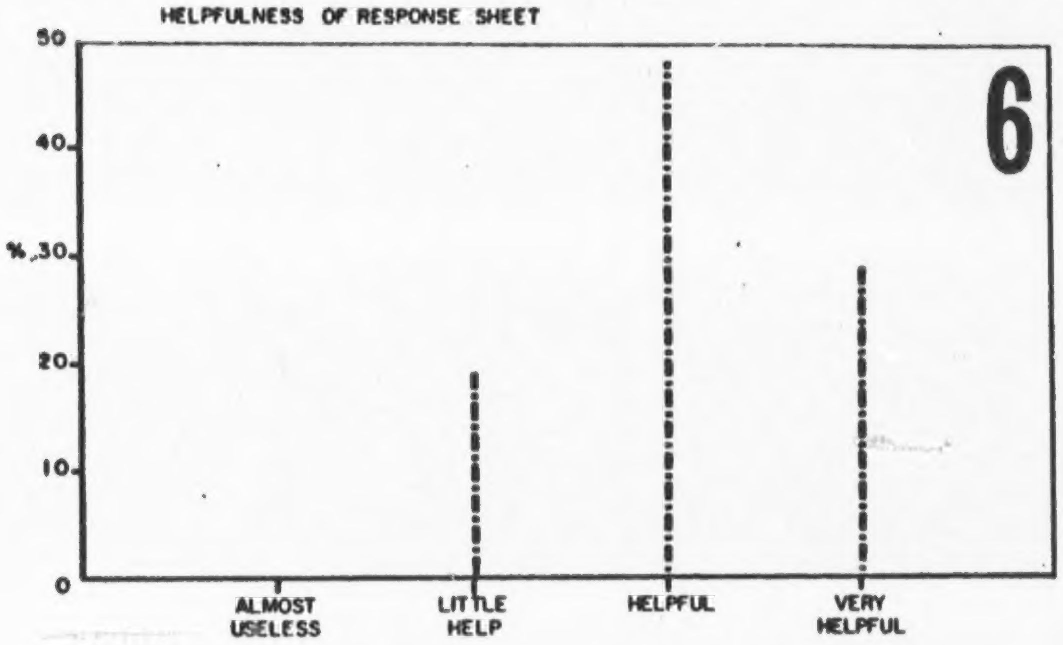
- reported for programs 2 - 12 on the following series of charts.

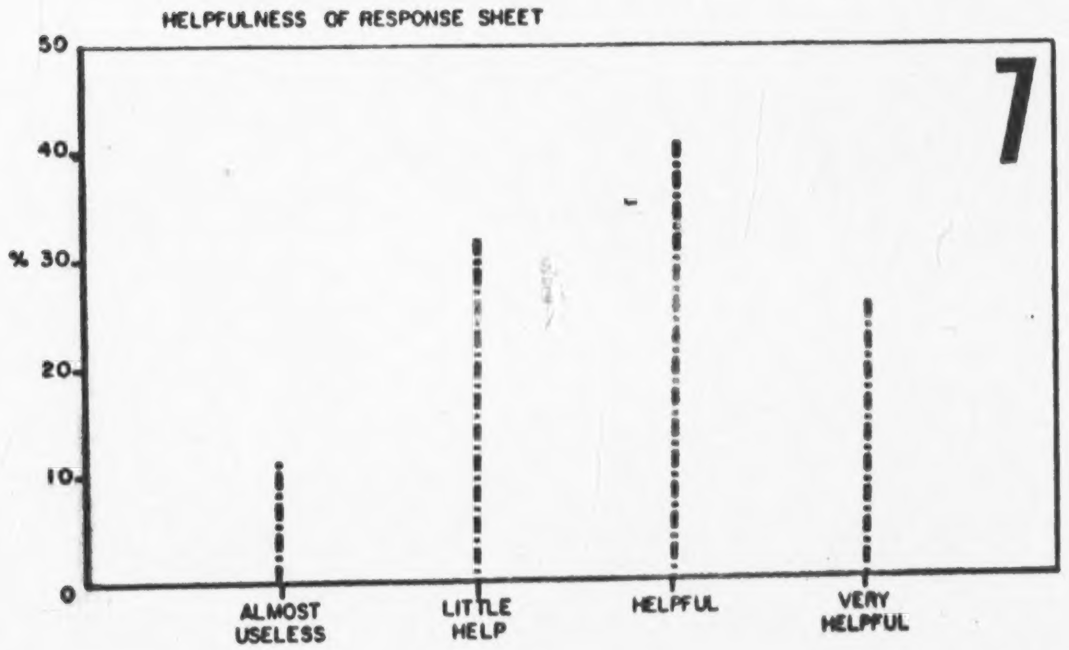


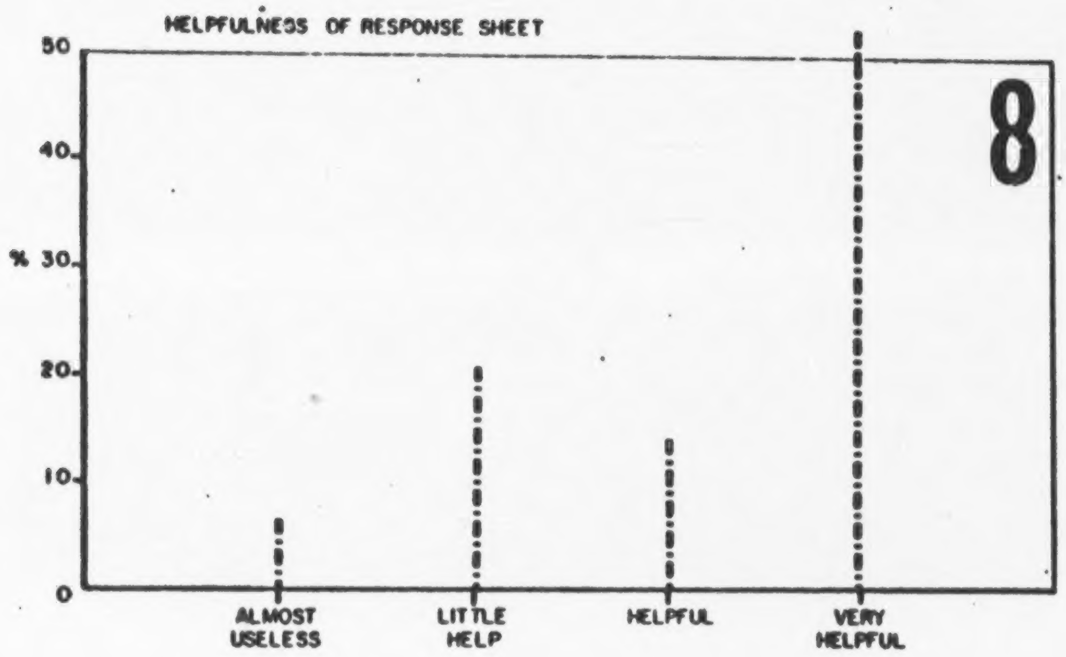


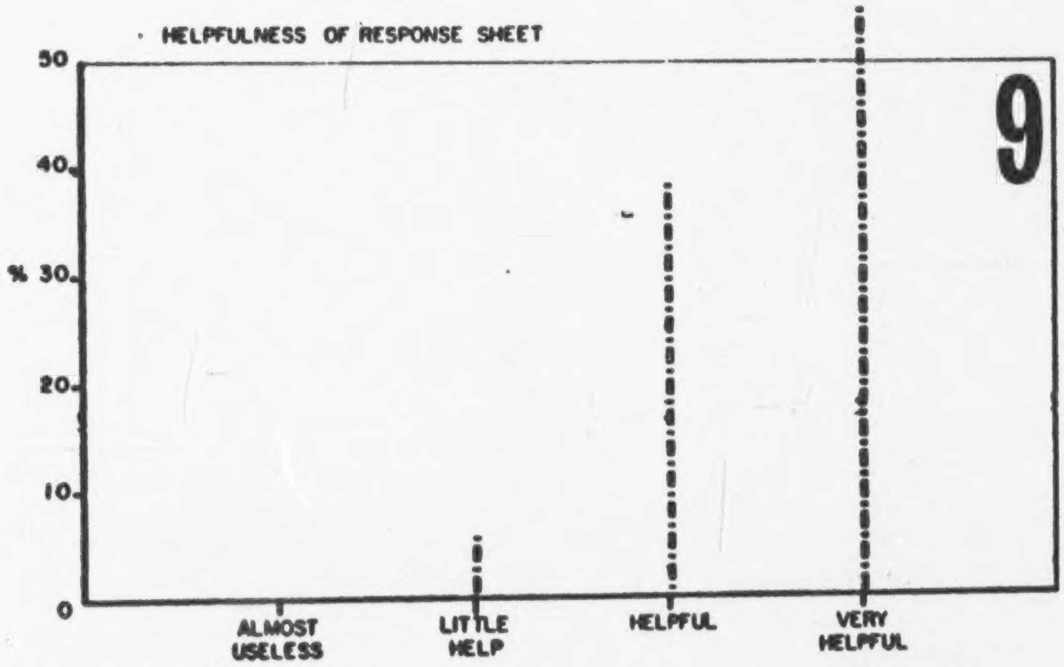

HELPFULNESS OF RESPONSE SHEET
4
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL

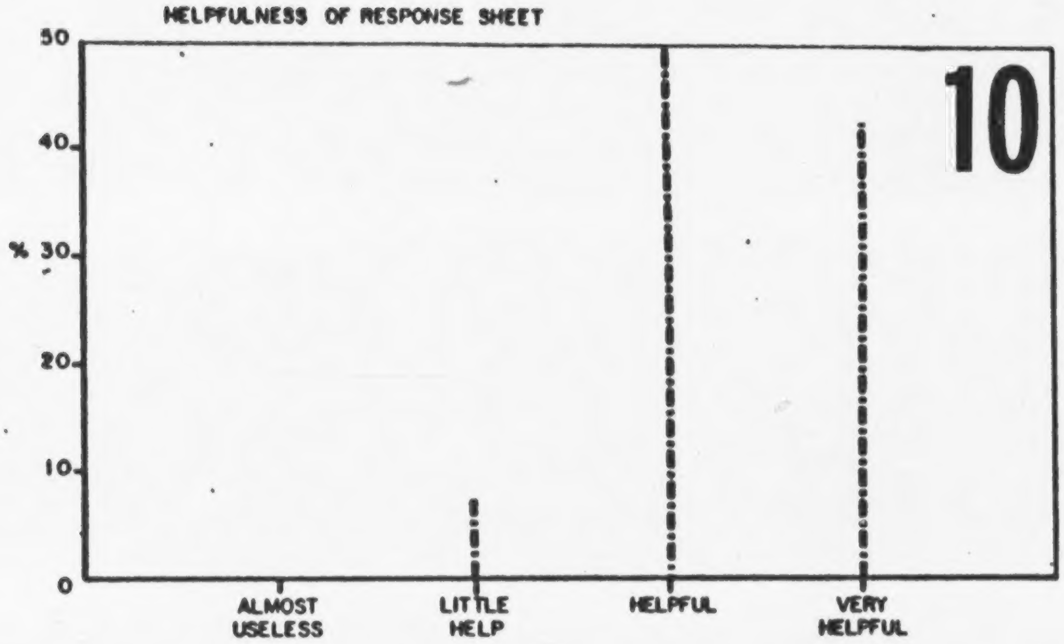

HELPFULNESS OF RESPONSE SHEET
5
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL

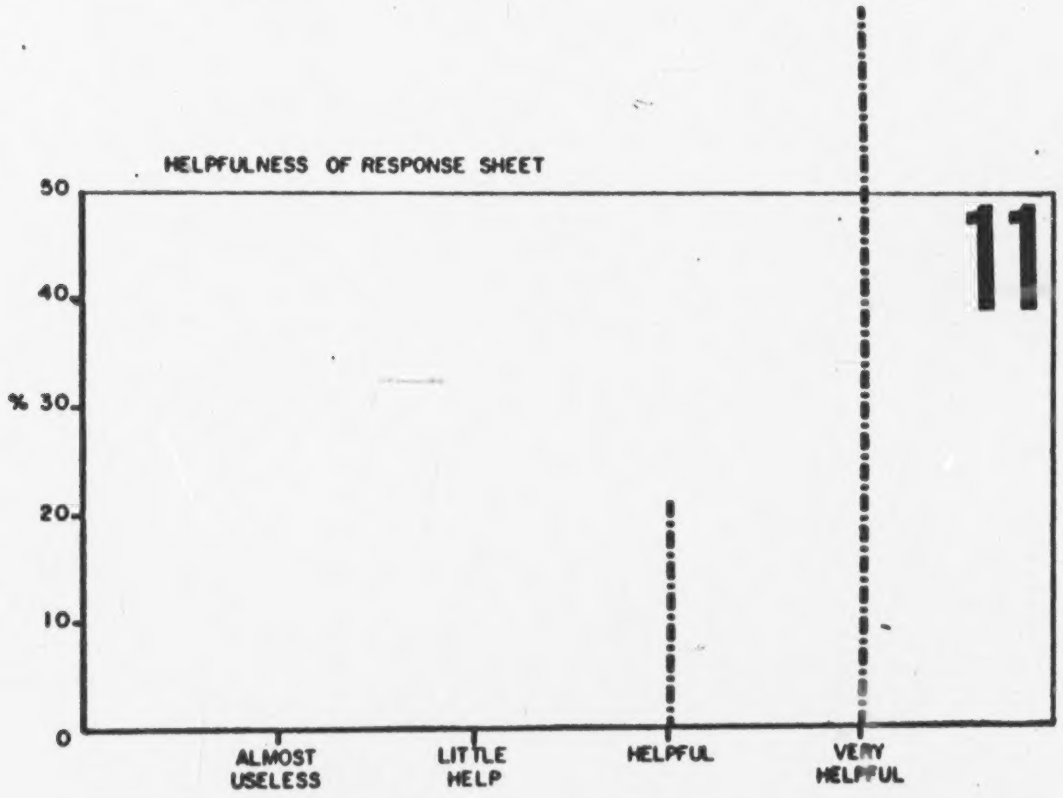

HELPFULNESS OF RESPONSE SHEET
6
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL

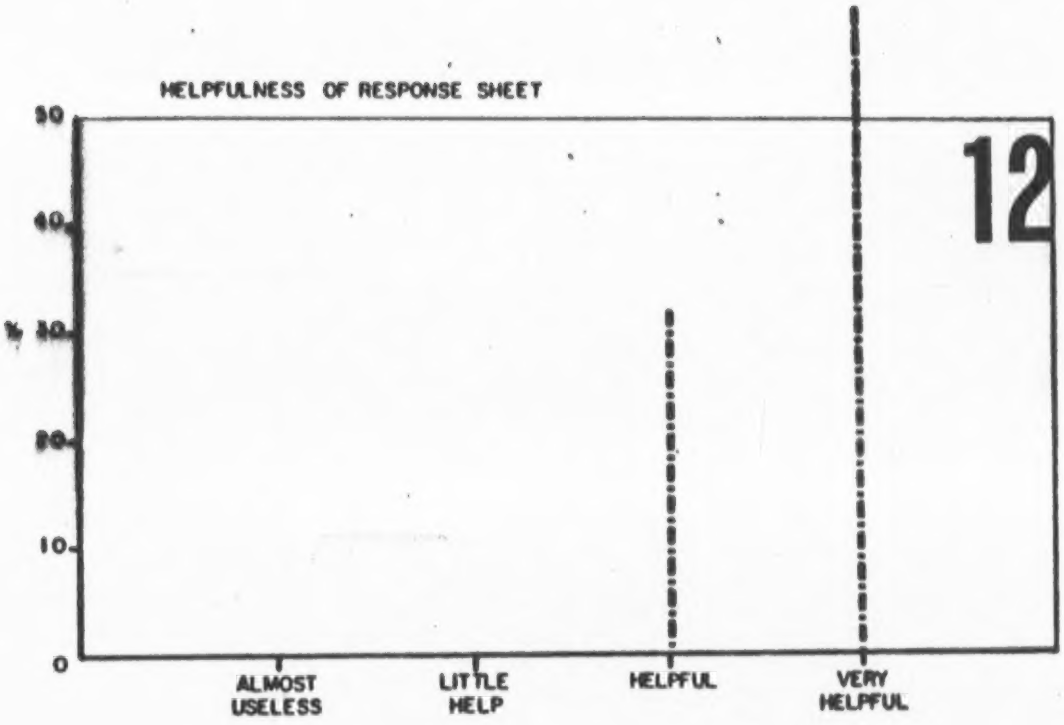

HELPFULNESS OF RESPONSE SHEET
7
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL


8
HELPFULNESS OF RESPONSE SHEET
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL


9
HELPFULNESS OF RESPONSE SHEET
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL


HELPFULNESS OF RESPONSE SHEET
10
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL


HELPFULNESS OF RESPONSE SHEET
11
50
40
% 30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL


HELPFULNESS OF RESPONSE SHEET
12
%
50
40
30
20
10
0
ALMOST USELESS
LITTLE HELP
HELPFUL
VERY HELPFUL

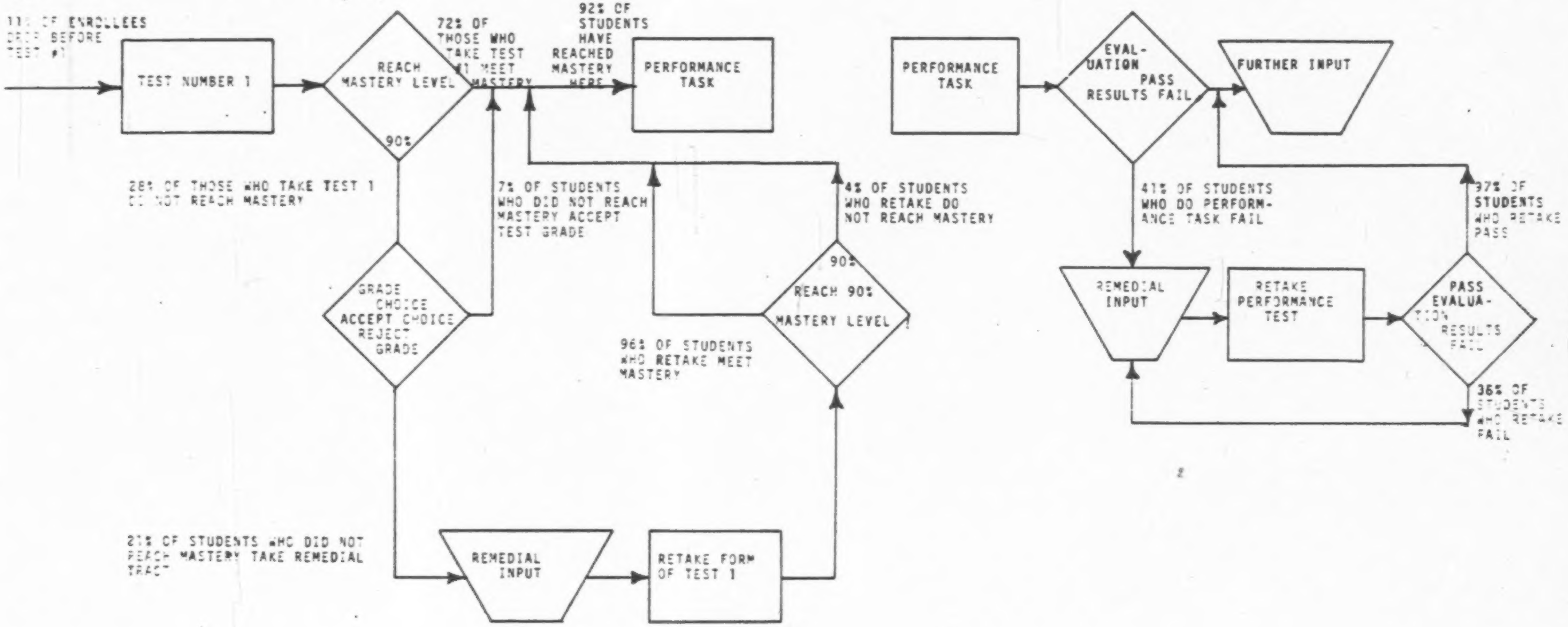

11% OF ENROLLEES DROP BEFORE TEST #1
TEST NUMBER 1
REACH MASTERY LEVEL
90%
72% OF THOSE WHO TAKE TEST #1 MEET MASTERY
92% OF STUDENTS HAVE REACHED MASTERY HERE
PERFORMANCE TASK
28% OF THOSE WHO TAKE TEST 1 DO NOT REACH MASTERY
7% OF STUDENTS WHO DID NOT REACH MASTERY ACCEPT TEST GRADE
GRADE CHOICE
ACCEPT CHOICE
REJECT GRADE
4% OF STUDENTS WHO RETAKE DO NOT REACH MASTERY
90%
REACH 90% MASTERY LEVEL
96% OF STUDENTS WHO RETAKE MEET MASTERY
21% OF STUDENTS WHO DID NOT REACH MASTERY TAKE REMEDIAL TRACT
REMEDIAL INPUT
RETAKE FORM OF TEST 1
PERFORMANCE TASK
EVAL-UATION PASS RESULTS FAIL
FURTHER INPUT
41% OF STUDENTS WHO DO PERFORM-ANCE TASK FAIL
97% OF STUDENTS WHO RETAKE PASS
REMEDIAL INPUT
RETAKE PERFORMANCE TEST
PASS EVALUA-TION RESULTS FAIL
36% OF STUDENTS WHO RETAKE FAIL

FIGURE 4. FLOW-CHART OF STUDENT PROGRESS

APPENDIX D

A PERFORMANCE CURRICULUM IN UNDERGRADUATE TEACHER EDUCATION

Rogers McAvoy and Alvin R. Carter
West Virginia University

The usual undergraduate teacher education program is designed from a model which assumes that the beginning student should complete a series of foundation courses before entering courses in methods and experiences in student teaching. Theoretically, the function of required foundation courses is to provide the student with a body of knowledge about principles of learning, child and adolescense development, and procedures of measurement and evaluation. Supposedly, the content from these courses is to serve as a basis for methods in teaching and actual classroom practice which follow after completion of the foundation courses. This model can best be referred to as a vertical approach to instruction with the inherent assumption being that the student must first acquire a body of knowledge which is then translated into practice at some later time.

This model with the typical undergraduate teacher education is illustrated in Figure 1.

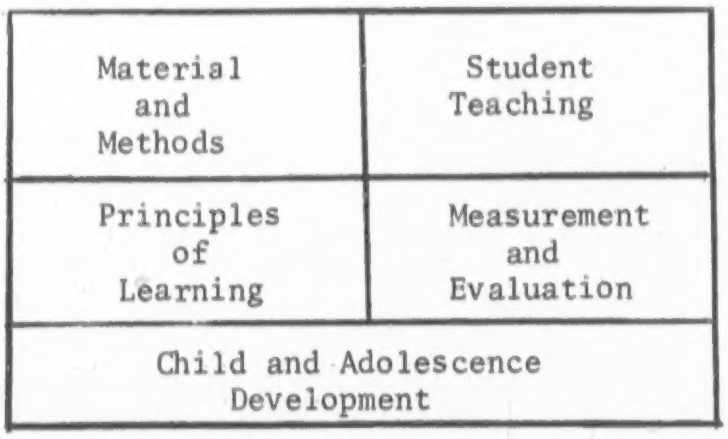


Figure 1. Representation of Vertical Design for Undergraduate Teacher Education

Ryan[1], in his examination and discussion of the professional education model, referred to the early foundation courses and subsequent practice as two distinct categories of experience. The foundation block is the professional sequence Ryan labelled as exposure experience and the student teaching block as total immersion experience. More importantly, however, Ryan identifies and raises in his investigation the more significant issue of the relationship between classroom oriented exposure experiences and the immersion experiences in student teaching. After a comparison of the professional education model with others, Ryan concluded that, "Much of teacher training is ineffective because it is based on a rather doubtful model." Ryan's basic criticism of the model centers on the lack of a tight relationship between the content of individual lessons and the task which the teacher will be called upon to perform. Any attempt to improve teacher education, then, would require starting with a new and more effective model. Attempts to patch an ineffective model would have been fruitless.

An experimental situation at West Virginia University provided an opportunity to formulate a new model and field test its effectiveness. The one theme directing the development of the model was that it should incorporate basic principles of learning in all its aspects and operations. While the theme was carried out in many phases of its operation, the rationale of the model was perhaps best stated in the writings of Woodruff.[2] Particularly important was Woodruff's discussion of the necessity for a trial stage in concept acquisition and validation. Woodruff expresses the point in this way.

> From this discussion process, which is typical of much classroom talk, the individual can have a concept which satisfies an achievement-test question, but which may not enable him to carry out an adjustmental act in a real situation. That is, he "knows" something, but he cannot make it work when he tries to act on that knowledge...In operant conditioning terms, environmental control of behavior is being established and inappropriate responses are being eliminated.

Woodruff goes on to point out that, "School learning is generally deficient in the trial stage of learning and thus tends to have little direct transfer value. Formal education tends to emphasize discussion about concepts and to deemphasize empirical concept validation."

A study of undergraduate students in teacher education demonstrates the validity of Woodruff's observations.[3] This study, done at West Virginia University, compared the performance of students on a paper-pencil test at the end of an instructional unit with their ability to apply the principles learned in a controlled teaching laboratory. The outcome was a .06 coefficient of correlation between the paper-pencil performance and the task performed in the controlled laboratory. Such results demonstrate no relationship between what the student "knows" and what he is able to put into practice in a given situation. The implication for instructional design is that transfer from knowledge level to behavior must be deliberately planned for use in an instructional system.

Specifically, then, what was called for in order to offset the deficiencies in teacher education, was a model which permitted the student an opportunity to translate his cognitive learning into performance at a time when the concept was first acquired. It is this kind of direct relationship which makes the concept meaningful and practical to the student. Herein, too, is the real meaning of relevancy in instruction.

The model adopted from the above rationale provided not only an opportunity for the student to carry each concept acquired to a performance level, but it also offered an opportunity to experiment with different modes of presenting material and more flexible modes of instructional design. The model is illustrated in Figure 2.

Principles of
  Learning
  Development
  Measurement
  Media
  Methods

Controlled
Laboratory
Experience

Field Experience

Student Teaching
  Experiences

Figure 2. A Performance Model for Teacher Education

The model as implemented in the undergraduate program at West Virginia University incorporated several other innovative modes of instruction including the specification of performance objectives, mediation of content, student interaction with instructional material, flexible scheduling with some individualized instruction, remedial loops to encourage mastery, feedback systems on student performance, and a more effective motivational system.

The model, as operationalized, is represented in Figure 3.

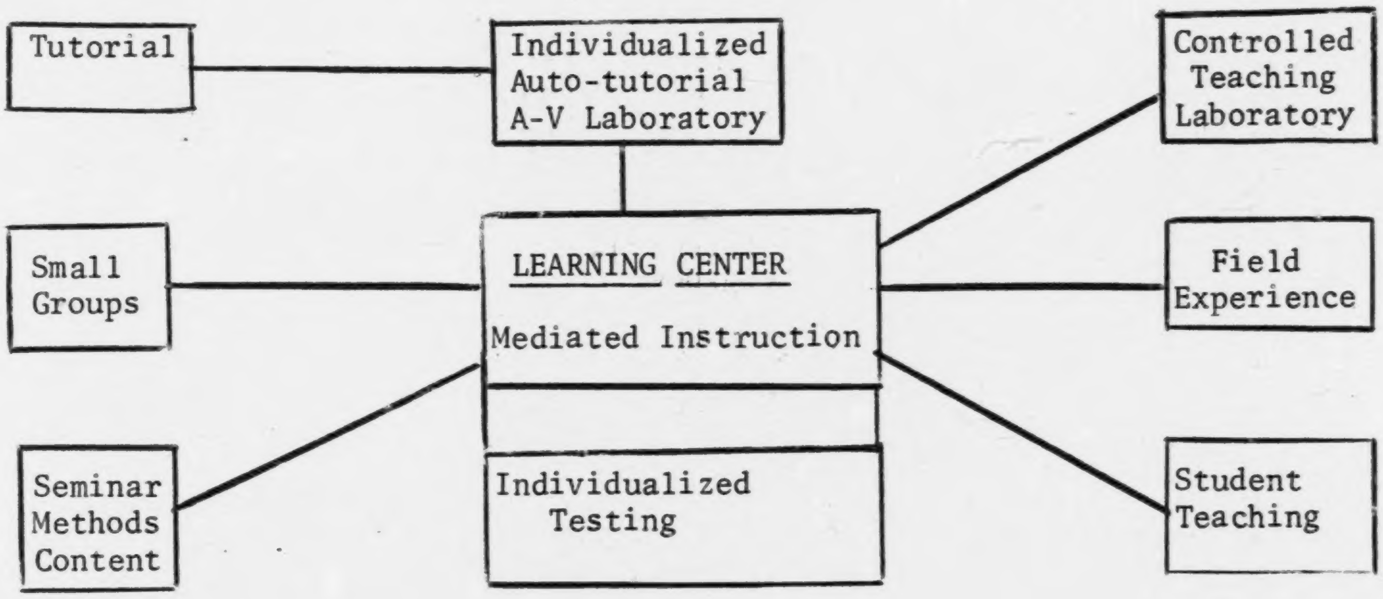


Figure 3. Operational Model for a Performance Curriculum in Teacher Education.

Auto-tutorial A-V Laboratory

All students have an early experience in the auto-tutorial A-V Laboratory. The function of this lab is to provide students with the skills for operating six to ten instructional machines. These skills are essential to the operation of instructional equipment in the Learning Center. Thus, students acquire basic skills in machine operation which are then maintained through the operation of equipment in the Learning Center.

The laboratory consists of a series of individual stations each with a basic machine. Each station is supplied with programmed materials to assist with the instructional phase of the operation. Students move through programmed material to the actual operation of equipment. In each case, performance criteria are specified. Students are checked out as they reach proficiency in operation of the machine. A student must have reached performance level and be certified to operate the machine before he can receive instruction through mediated programs in the Learning Center.

Learning Center-An Instructional Laboratory

The content from the basic foundation courses has been organized into instructional units and mediated for presentation in the Learning Center. Mediation has been accomplished by using audio and video tape, filmstrips, slides, and films. Instructional units include performance objectives, a pre-test, recommended instructional activities and post-test written over the objectives for the unit. Mediated presentations are accompanied by student response sheets and a short check-out quiz. After completing a series of instructional activities, the student may request a criterion test. A performance of 90 per cent is required on the criterion test for a grade of "A". A student falling below this level of performance has the option of taking the lower grade or retaking the test after he has completed a remedial loop in the instructional sequence.

The Learning Center provides considerable opportunity for individualizing instruction if individualization is taken to mean that one receives appropriate material at a time when he is ready for it. Most of the material presented is related to other activities, but one may go through the instructional sequences at his own rate.

Controlled Teaching Laboratory

The function of the controlled teaching laboratory is to permit students to bring each concept learned to a performance level. Each unit of instruction presented in the Learning Laboratory is accompanied with a task to be performed in the Teaching Laboratory. As the student is ready to teach, he schedules time in the laboratory situation with a learning team consisting of five class-mates. The teaching session is video-taped and critiqued according to specified criteria. If the student's performance does not reach criterion level, he may, after practice, repeat the performance.

Field Experience

Field experience is started after a student has completed three basic units of instruction or one semester of course work. The field experience may take the form of teacher aid activities, assisting in a tutorial program, or instructing in other educational settings. This experience is related to further instructional material presented in the Learning Center.

Tutorial and Small Group Seminars

Tutorials or small group seminars are used in a flexible manner throughout the entire program. These experiences usually begin as tutorials with instruction in the Learning Center then becoming discussion groups or teaching teams in later phases of the program. Seminars related to methods and subject matter areas accompany student teaching.

Student Teaching

Presently, student teaching centers are being developed in population centers around the state. Greater responsibility for this phase of the program is being assumed by the public school system where centers are being established.

With the use of controlled teaching laboratories and field experiences, students are not suddenly imerged in a student teaching situation but brought to it gradually. Consequently, they are more prepared to assume a greater role in handling classroom activities.

Student Achievement

In addition to the attempt to bring all concept learning to a performance level, a goal of the Learning Center has been to individualize and maximize student learning. Behavioral objectives were used with all mediated presentations. A mastery level was set at 90 per cent on all criterion tests for a grade of A. An examination of student achievement over one semester (second semester 1968-69) shows a skewed distribution toward the mastery direction. These data are presented in Table 1.

Table 1. Distribution of Grades

	A (90%)	B (80%)	C (70%)	C (60%)	F (50%)	Incomplete	Withdrew	Total
Frequency	89	38	7	0	17	70	38	259
Percent	34.3	14.6	2.8	0.0	6.6	26.9	14.9	100

The grades above are for 259 students in the beginning course during the Spring Semester 1968-69. Of this number, 151 students or 58 per cent finished the course by the end of the semester. A few students actually completed all work before the semester ended while 70 students, or 26.9 per cent, elected to take an incomplete at the end of the semester in order to complete the course with a higher grade. These data would suggest that achievement when approached in this manner is more a function of time than it is the task to be performed. In fact, the distribution of students by time begins to approach the normal distribution with some students finishing early, most at the close of the semester, and others continuing beyond one semester.

The number of students reaching mastery (34.3 per cent at 90%) would indicate that students do prefer the higher grade when given the opportunity to achieve it. Grades would appear to be an effective means of motivation when students are permitted the opportunity to earn them.

One disturbing figure might be the number of students, 38 or 14.9 per cent, who withdrew from the course during the semester. Two factors may account for the high number. First, students were required to learn new behaviors rather than attending class three days per week. In the beginning students had difficulty learning the behaviors expected of them. Secondly, many students were unable to assume the responsibility for their own learning. These students demonstrated little or no progress and, consequently, were so far behind they elected to withdrew from the course.

Figure presents a flow-chart of the progress of students through the course indicating check points and per cent of achievement.

Student Critique

A critical consideration in the success of any innovative program is the attitude of participants toward the program. An attitude measure was administered to students at the close of the semester in an effort to tap this phase of the operation. The scale asked students to rate 32 aspects of the program on a 5 point scale from dislike very much to like very much. A portion of rated variables are shown in Figure 5.

Total Number of Points		Questions Asked
38.53	363	- Lectures by audio tape
40.34	380	- Visual slides without audio tape lecture
41.40	390	- Writing programmed instruction
43.74	412	- Fill in and essay questions on exams
45.01	424	- This course in general compared to a regular college class meeting 3 times a week
45.33	427	- Material presented by automated instruction versus presentation by teacher
46.60	439	- Films on operant conditioning
47.77	450	- Lectures by video tape
49.04	462	- Lectures by audio tape with visual slides
50.64	477	- The Case II Tape and Slide presentation
51.38	484	- Worksheets on behavioral objectives
51.91	489	- Lab exams
52.87	498	- Criterion test covering specific objectives of unit
53.08	500	- Writing behavioral objectives
53.18	501	- Films

53.61	505	- Mager's Writing Instructional Objectives
54.98	507	- Teaching an objective Taking test at testing sessions
54.99	518	- Teaching a discrimination and generalization task
55.52	523	- Organization of course by units
55.63	524	- Teaching an instructional objective
57.54	542	- Active involvement sheets & Lab programs
59.55	561	- Play back of video tape
60.30	568	- Flexible lab schedule
60.62	571	- Method of grading by performance instead of curve
63.38	597	- Short answer exams
64.97	612	- Having objectives passed out at the beginning of a unit
65.61	618	- Opportunity to repeat material week after week
67.20	633	- Taking tests as you are ready for them
69.21	652	- Being able to retake test

Figure 5. Results of Critique

1. Ryan, Kevin A., "Occasional Papers, National Commission on Teacher Education and Professional Standards, NEA, No. 2

2. Woodruff, Asahel D. "Cognitive Models of Learning and Instruction," 1 Instruction: Some Contemporary Viewpoints, Chandler Publishing Company, 1967.

3. Minor, John, "Use of a Controlled Teaching Laboratory As an Approach to Valid Classroom Tests" An unpublished paper, West Virginia University, 1969.

APPENDIX E

FAIRMONT STATE COLLEGE: AN ATTITUDE SURVEY OF STUDENT REACTION TO AN INSTRUCTIONAL METHOD

Submitted

September 1971

In 1967, the Federal Government funded a cooperative Title III Project that involved the development of undergraduate teacher education programs and the development of materials to be used in these programs.

Each developing institution refined different instructional models and pursued different general objectives in the use of project materials. Fairmont State College's primary objective in the use of project produced materials was to upgrade instruction by utilizing project produced and purchased mediated and written content as a supplement to the instructional model already in existence. A series of pilot studies was designed to measure the success in achieving this objective.

One of the field tests conducted on the campus of Fairmont State College consisted of a series of two opinion surveys administered to senior educational psychology students during the 1970-71 academic year. The intent of the study was to collect an analyze written measures of student reactions in the following information areas:

1. to analyze on a five point scale student perception of the quality of the project produced material; and
2. to evaluate student reaction to the mediated content as a method of simulated classroom observation.

The units of mediated content were a series of 16 mm INCITE films designed to simulate classroom observation, a Teacher Mode Test Unit made up of slide-tape programs and written content, a written mode Learning Unit, and a written mode dealing with Flanders Observational Material.

Method. A series of two opinion surveys was conducted over a period of two years in Educational Psychology at Fairmont State College.

The first survey was administered to one hundred students enrolled in educational psychology during the 1969-70 academic year. A second equivalent form opinion survey was administered to sixty-eight senior students enrolled in educational psychology during the 1970-71 academic year. One question was added to the second instrument to allow the experimenter to rank student reaction to all the mediated and written materials presented in this class during the 1970-71 academic year.

Results. 1969-70 Analysis

1. 51 of 70 liked the INCITE simulation films and the Flanders material in addition to one school observation. 19 of 70 were in favor of any regular school observation.

1970-71 Analysis

2. 50 of 64 felt that the supplementary system of presentation was not distracting
14 of 64 felt that the supplementary presentations were distracting

3. The following results were tabulated from a 1 to five scale (5 excellent, 1 poor) in the ranking of materials used in this classroom:

	Total	Average	Ranking
Public School Observation	306	4.50	1
Project Purchased Incite Films*	270	3.97	2
Incite Film Observations*	258	3.79	3
Teacher Made Test Unit*	249	3.66	4
Flanders' Observation	239	3.50	5
Flanders' Prepared Material*	233	3.42	6
Textbook Films	230	3.38	7
General Films	218	3.20	8
Learning Unit*	196	2.88	9

Project produced or purchased material

The following additional comments were most frequently mentioned:

1. More was learned from the films and the Flanders Material than the test;
2. The Learning Unit Material would have made a greater contribution if more time would have been allocated for its content;
3. The different kinds of analysis were good experience;
4. The positive ability of the instructor handling the course; and
5. A positive reaction to the active-involvement sheets presented with mediated content.

Conclusions. When the students involved in this study were given a choice in reacting either positively, negatively, or not at all to the project produced mediated and written content, 150 positive reactions were tabulated, 66 no reactions were tabulated, and 48 negative reactions were tabulated. A significant majority reacted positively to the effectiveness of the supplementary use of the mediated and written content.

In addition, a large majority of students reacted positively to the integrated use of simulated classroom observation techniques and regular classroom observation techniques at both the secondary and elementary level. This observation technique was given a high rating as an instructional method by 71% of the sample group.

Finally, the project produced and purchased materials were ranked 1,2, 3,5 and 8 out of eight kinds of mediated content used in the classroom during the pilot study. The non-project produced or purchased material was ranked 4,6 and 7 by the students involved in using the material.

The Learning Unit was ranked last from the students' point of view. This project produced unit will be re-examined from a process and content point of view.

In Summary. The significant number of positive student attitudes associated with the project purchased and produced content indicate its general acceptance from a student's point of view as a supplement to classroom instruction at Fairmont State College.

In addition, the high ranking given the project produced material on a five point student self-perception scale indicates that students believe the project materials are making a positive contribution to the classroom learning environment.

APPENDIX F

SHEPHERD COLLEGE: AN ATTITUDINAL SURVEY OF STUDENT REACTION TO AN INSTRUCTIONAL METHOD

Submitted

September 1971

In 1967, the Federal Government funded a cooperative Title III Project that involved the development of undergraduate teacher education programs and the development of materials to be used in these programs.

Each developing institution refined different instructional models and pursued different general objectives in the use of project produced materials.

Shepherd College's primary objective in the use of project produced materials was to give advanced educational psychology students experience in mastery learning and self-instructional techniques. A series of pilot studies was designed to measure the success in achieving this objective.

One of the pilot studies conducted on this campus consisted of an attitude survey administered to thirty senior education students in the spring of 1971. The intent of the study was to measure student assessment of a group mode self-instructional approach that utilized project produced materials as an instructional method.

The unit consisted of behavioral objectives, four slide-tape programs and involvement sheets dealing with measurement concepts, note outlines and project produced pre-tests and post-tests. A large group mode was used in the presentation of this content. The pilot study lasted six days.

Method. The attitude survey was administered at the end of the six day instructional sequence and after the post-test had been administered to the class. The survey instrument was anonymous. (see appendix A)

Results. Figure I represents the results of the attitude survey.

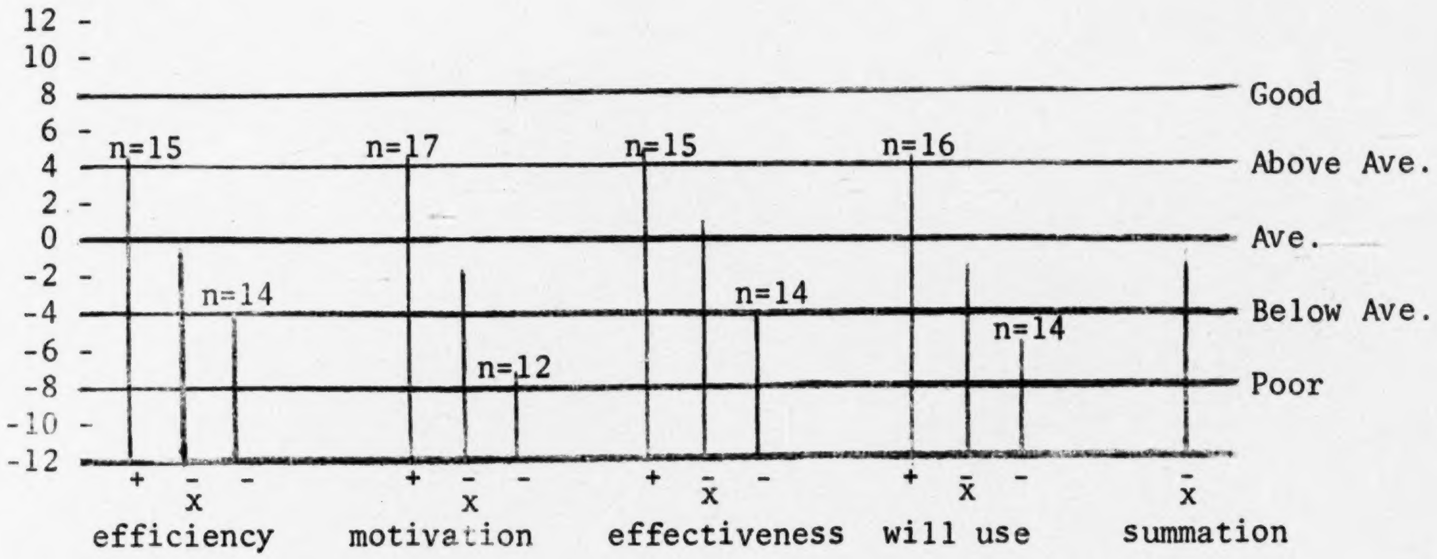


Figure I

The following generalizations were concluded:

1. In the study a larger number of students had favorable attitudes toward self-instruction than students with unfavorable attitudes (16+ and 14-);

2. There were three distinct groups of students: students with extreme negative attitudes, students with extreme positive attitudes, and students clustered around the mid-point;

3. The students that have unfavorable attitudes toward self-instruction are more negative with their attitudes than those students with favorable attitudes are positive;

4. The students in the middle group with favorable attitudes toward self-instruction rate the method of presentation more positive than those students in the middle group with unfavorable attitudes are negative; and

5. One-half (16) of the students in this sample indicated they would use this method of presentation if the materials appropriate for this mode of instruction were made available.

Discussion. The mastery position is one of individual differences requiring different instructional modes of presentation. And since each learner has unique entry characteristics or individual differences, the instructional requirements of each learner would differ. It would, then, not be unusual for groups of students to either like or dislike an instructional method.

Nor is it unusual for the mean number of negative attitudes to be smaller than the mean number of positive attitudes in the middle group.

The smaller mean number value of negative attitudes as compared to the mean value of positive attitudes in this group is characteristic of new self-instructional programs and is similar to the initial attitude pattern identified in institutions that are initiating instructional change.

The newer instructional models require time for new student behaviors to be learned. As these behaviors are learned, the ratio of positive to negative attitudes is increased. Support of this position is based on attitudinal studies at other project related developing institutions.

It is the writer's position that the extreme negative reaction of some of the students reflects the frustration experienced by these students when exposed to an instructional mode that is not consistent with their unique abilities and characteristics. Further research is necessary if these students are to be identified and placed in instructional modes that meet individual learning needs.

Conclusion. The 53% of the sample who demonstrated favorable attitudes toward self-instruction and who indicated that they would use this method of presentation if appropriate materials were made available indicates that the Shepherd College objective was more than accomplished. Not only have advanced students been exposed to self-instruction, they demonstrate positive attitudes toward the approach and a willingness to use the approach if appropriate materials are provided.

COOPERATING INSTITUTIONS PROJECT
An Attitudinal Survey
Shepherd College
May, 1971

Your opinions of the method of presentation in which you have recently participated is of interest to your instructor. He is most concerned with your assessment of the slide-tape unit as an instructional method rather than your criticism of the particular slide-tapes used.

Indicate your opinions by placing a checkmark (✓) at some point on each of the five continua found beneath the questions which follow. The location of the mark will indicate (1) the direction of your opinion, viz., favorable or unfavorable and (2) its intensity as measured from the mid-points of the continua.

Your cooperation is appreciated by the instructor.

Efficiency can be represented by the equation: efficiency = $\frac{\text{output}}{\text{input}}$
The efficiency of an instructional method may be estimated by weighing how much was achieved in terms of learning outcomes against the effort expanded to achieve these outcomes.

HOW EFFICIENT DO YOU ADJUDGE THE METHOD IN QUESTION?

very ineffective	rather ineffective	mid-point	rather effective	very effective

Motivation energizes a person's behavior, sustains his interest, and lends direction to his actions. If we were to assume that a method of presentation might contribute to motivating the student;

IS THIS METHOD CONDUCIVE TO SUSTAINING THE MOTIVATION OF THE STUDENT?

no	doubtful	mid-point	probable	yes

Effectiveness might be defined in terms of how thoroughly the learning outcomes, or objectives, are mastered.

HOW EFFECTIVE DO YOU ADJUDGE THIS METHOD?

very ineffective	rather ineffective	mid-point	rather effective	very effective

Were you the instructor of this course and slide-tape programs were available for each unit of the course;

WOULD YOU USE THIS METHOD OF PRESENTATION?

never	seldom if ever	mid-point	sometimes	always

APPENDIX G

A COMPARISON OF A MULTI-CONTENT APPROACH AND PROGRAMMED INSTRUCTION

Submitted

September 1971

In 1967, the Federal Government funded a cooperative Title III Project that involved the development of undergraduate teacher education programs and the development of materials to be used in these programs.

The Title III Federal Project has set as a goal during this pilot study phase the implementation of presentation modes that would accomplish the following objectives:

1. to accelerate learning rate
2. to give students as broad a range as possible in the presentation of content; and
3. to satisfy student requests for greater variance in presentation modes.

Exploratory experimental research was attempted in an effort to establish if greater variance in presentation modes could be iniated without decreasing learning rate of students enrolled in a pre-service teacher education program.

Specific research was conducted at Fairmont during the second semester, 1970-71, in an effort to answer this question:

Is the project produced self-instructional programmed text, Writing Worthwhile Behavioral Objectives, by Julie S. Vargas as effective in helping students in a group mode self-instructional approach to achieve mastery in a unit concerning the writing of behavioral objectives as defined by a teacher paper and pencil test than a self-instructional unit presently being used in a pre-service course at Fairmont State College.

Assumptions:

1. the information contained in both methods of presentation is equivalent; and
2. the other units presented in the course follow a similar presentation format as is presently being used in the control group.

Procedure:

Two class sections were randomly assigned to a control group or an experimental group. The sample consisted of twenty-one senior pre-service teacher education programs at Fairmont State College subjects assigned to the experimental group (Group A) and twenty-five pre-service teacher education program students at Fairmont assigned to the control group (Group B).

The following directions were given to the experimental group (Group A).

Each student in Education 442, Section 1, has been loaned a programmed text Writing Worthwhile Behavioral Objectives by Julie Vargas. Your responsibilities regarding the use of the text are listed below.

1. Do not write in the text at any time as they must be returned for further use. Prepare your own response sheets per book examples.
2. Your use of the program is part of an investigation regarding the teaching of objective writing and will require each of you to avoid sharing the text with other sections of the block.
3. You have been given the text on Monday, January 25, 1971. Your use of the text is to be according to the following general schedule. Please prepare your own response sheets.
    - A. Monday: During class and Monday night you are to read and complete chapters I, II, III.
    - B. Tuesday: Peer interaction and work on chapters IV and V.
    - C. Wednesday: Peer interaction and work on chapters VI and VII.
    - D. Thursday: Peer interaction and work on chapter VIII.
    - E. Friday through Sunday: Work on your Unit incorporating the skills and knowledge developed from use of the text and by applying such to the unit format distributed during an earlier class session.
    - F. Monday: (1) Collection of texts. (2) An evaluation of the program. (3) A look at the Unit.
4. Since the text will be collected, your need for note taking should be satisfied as you complete the above exercises.
5. Limit your work to this one source which means that use of our regular text by Pepham and Baker will be delayed until a later date.

The following directions were given to the control group (Group B).

Students in Education 442, Section 2, will be instructed in the writing of behavioral objectives via: (1) The use of the assigned text, Systematic Instruction by W. James Pepham and Eva I. Baker; (2) A related filmstrip-tape program produced by Vimset Associates, Los Angeles, California; and (3) Selected mimeograph handouts. You are part of an investigation regarding the teaching of objective writing and thus are requested to avoid sharing your handouts or discussing the filmstrip-tape information until after Monday, February 1, 1971.

The schedule for the class sessions this week is as follows:

1. Monday: View filmstrip #1 and complete response sheet #1. Read chapter 2 in the next text as a review. Read chapter 3, pages 19-39 and handouts in preparation for Tuesday.
2. Tuesday: View filmstrip #2 and #3 and complete related response sheets. Read chapter 3, pages 39-43.
3. Wednesday: Chapters 5 and 6, pages 63-89.
4. Thursday: View filmstrips #5 and #6 and complete related response sheets. Review handouts and chapters 2 through 6 in textbook.
5. Friday-Sunday: Work on your Unit incorporating the skills and knowledge developed from use of the filmstrips, handouts, and text assignments by applying such to the Unit format distributed during an earlier class session.
6. Monday: (1) An evaluation of the program. (2) A look at the Unit.

Both groups were exposed to similar time limitations, 60 minutes of class time per day for a four day sequence. The professor served only as an observer or operator of media-ware. At no time did he enter into verbal interaction with the students during the four day experimental period.

Results:

The hypotheses were:

$$Ho: u_1 = u_2$$

$$Ha: u_1 \neq u_2$$

The results are:

Results	t-test	t-ratio	w	α
accept null	tc	1.63	2.06	.05

The research indicated that the Vargas text does not increase the achievement level of students. It does indicate that there is no significant difference between the multi-content approach presently being used in this classroom and the

Vargas text as measured by cooperatively produced project paper and pencil tests.

The Vargas text does offer the student a new experience in a branching programmed instructional technique. In addition, the technique introduces a major unit into the instructional sequence that consists of a low cost self-instructional written presentation mode that may be taken from the classroom and-or learning center and reused by several generations of students. And finally, the technique does satisfy the students' request for greater variance in presentation.

Conclusion. The Vargas programmed text offers a unique instructional experience for students that contributes variance to a presentation mode sequence. If these contributions are objectives in the management of a classroom that is presently using a multi-content approach similar to the one used in the control group, then this research supports the position that the programmed text is of value in the instructional sequence.

APPENDIX H

USE OF A CONTROLLED TEACHING LABORATORY AS AN APPROACH TO VALID CLASSROOM TESTS

Problem
Submitted to Department of Educational Psychology
West Virginia University

by
John Minor

Introduction:

Schools of education have been training teachers for years, or have they? They continually graduate students who meet the state requirements prescribed for certified teachers. But just as continually, practicing teachers, the end products of these schools of education, grumble about "professors and their ivory towers" and complain about the uselessness of their college training to their present jobs as teachers. If these charges of non-relevance are legitimate, the next question is "Why?". Certainly the volumes of research done on the effectiveness of various teaching techniques and curriculum content indicate that many educators are interested in producing effective teachers. Why then, considering the research efforts expended, has progress towards more meaningful teacher education programs moved so slowly?

One answer is that educators, and schools of education, have demonstrated an almost religious preoccupation with the acquisition of verbal skills.[1] Almost without exception tests used in schools, regardless of whether they are research criterion to evaluate teacher effectiveness, instructural procedures, curriculum content, or end-of-a-semester final examinations given in the classroom, are designed to measure acquisition of verbal skills. (McKeachie 1963) The implicit assumption in this procedure is that demonstration of verbal mastery of course material is a valid predictor of an individual's ability to perform similarly on an ultimate criterion usually stated as the goal or objective of the class. The purpose of this study is to explore the validity of this assumption. Specifically

I intend to examine the relationship between student verbal recall of course material, as measured by the course final examination, and student ability to apply this course material to the task of teaching. The hypothesis is that there is no relationship between the two performances.

The Problem of Valid Information Retrival and the Controlled Teaching Laboratory:

There may be several reasons why educators have failed to use teaching performance to evaluate their teacher-training programs. However, the most obvious reason appears to be that it is easier not to. The tremendous costs and related problems of following graduates into their classrooms; the extended period of time which elapses between student instruction and the collection of performance data; and the methodological difficulties involved with measuring teacher performance in th classroom are some reasons which make it easy to understand why the problem, for the most part, has been ignored. My position is that a realistic alternative to ignoring the question of validity is to begin applying knowledge already gained thro research to the development of valid end-of-course examinations.

Developing tests with content validity is not new in educational circles. Educational texts and research abound with methodology for measuring curriculum contents. What I am suggesting is that examinations should be valid in terms of stated objectives of the course rather than in terms of predeveloped curriculum.[2]

The usual procedure is for an instructor to design a curriculum which presents the material to be learned in verbal form. He then designs an examination to measure the student's ability to recall the course material. The examination is considered valid if it appears to measure accurately what was learned during the instructional period. The problem with this procedure is that it is a closed system, i.e., the instructor designs a curriculum which he believes to be correct; he then designs a test to measure what has been taught by the curriculum; and then, if he is courageous, he judges the success of his instruction by the scores on this test. Unfortunately, this procedure is not grounded in the reality of the purpose for which this course of instruction is being given. The point is that examinations should be valid in terms of the stated goal (reason for giving the instruction) of the course rather than in terms of the curriculum content. From this position, a valid examination would be one that had high predictive validity for performance on the next task after leaving the classroom. Examinations with instructional objective validity rather than curriculum content validity would have the following advantages: (1) Provide immediate feedback regarding the relationship between curriculum and instructional objectives. (2) Provide immediate feedback regarding the effectiveness of various instructional objectives. (3) Course grades would have relevance in terms of predicting the student's ability to perform related tasks after leaving the classroom.

The basic procedure for developing tests that have instructional objective validity is (1) state the course objectives in measurable observable terms. For example, the objectives for a college of education course in English Literature would not be just "understanding English literature," but rather, proficiency at teaching English literature; and (2) development of an examination situation which correlates highly with the above stated measures of the course objectives.

Specifically, this study is concerned with applying the idea of instructional objective validity to a unit on "learning," which is part of the education major's required course in "Human Growth and Development" at West Virginia University. The instructional objective for the unit is to "teach students how to apply principles of learning to the task of classroom teaching." A test situation was developed which, based on knowledge gained from research in "transfer of training," appears valid regarding the instructional objective. This test required students to actually teach in the Controlled Teaching Laboratory.[3] The student's performance in the Controlled Teaching Laboratory was compared to his performance on the unit test (verbal recall of course material.)

The ideal situation to test the validity of the course examinations would be to correlate examination scores with measures of teaching performance in the classroom. Unfortunately, for reasons stated above, this information is unavailable at the present time. As an alternative, teaching performance in the Controlled Teaching Laboratory was used. The Controlled

Teaching Laboratory performance should, according to reported research findings, provide maximum positive transfer of training. That is, based on principles generated from research on Transfer of Training, the test situation used in this study should correlate positively with actual teaching performance. Taken from a comprehensive review of research done in the area of Transfer of Training, these principles are:

> Overall Task Similarity. Transfer of training is greatest when the training conditions are highly similar to those of the ultimate testing conditions.
>
> Stimulus Similarity. When a task requires a learner to make the same response to a new but similar stimuli, positive transfer increases with increased similarity.

In general, the more nearly the test situation approximates the ultimate performance situation, the greater the likelihood of positive transfer. (Ellis 1965)

The Controlled Teaching Laboratory is used as a training device and is basically a role playing situation where a small group of students, usually five, practice a specific teaching assignment on each other. Each teaching task is approximately five minutes long and is recorded on video tape. Following the teaching sessions, the group critiques each individual's teaching performance with regard to the specific requirements of the assignment. A criticism of the Controlled Teaching Laboratory is that is is an artificial situation in that students are teaching their peers, and the video tape recording could make them self-conscious. Even with these faults the

Controlled Teaching Laboratory has several advantages: First, the Controlled Teaching Laboratory closely approximates the actual teaching situation in terms of stimulus similarity and response similarity, i.e., the student doing his teaching will be required to make classroom-type responses of lecturing, answering questions, asking questions to classroom-type stimuli like a lesson plan, lecture notes, student questions, or the lack of student questions. Second, the Controlled Teaching Laboratory assignment is short (usually five minutes) and is free of concern for the students (other members of the group) being taught. This allows teaching assignments to be specific regarding content and/or methodology so that one particular teaching skill at a time may be observed, measured, and evaluated. Third, the Controlled Teaching Laboratory provides immediate feedback for both student and instructor. This means that in addition to being a learning situation, it can be used very easily for course examinations.

Design:

This study used a random 10% sample consisting of twenty-six (26) students enrolled in the West Virginia College of Education required course in "Human Growth and Development." One unit in the course is on Learning. After completing the work on this unit, students are given a customary type written examination covering the material in that unit. Following this, they are scheduled for a training session in the Controlled Teaching Laboratory with instructions to "prepare and give a five minute teaching session on a topic of your choice applying the principles of reinforcement you have just learned."

A major emphasis in the learning unit instructional material is placed on the use of positive reinforcement in the classroom. Students had been told how to apply social reinforcers in the classroom like saying "very good," "that's right," "smiling," etc. The measure of performance used in this study was the number of positive reinforcements applied by the student during the teaching session. A positive reinforcement was defined as a generally accepted positive statement and/or gesture emitted by the student teacher immediately following the response of one of the students being taught.[4] For example, if in response to a student answer, the student teacher said "good," that counted as one. If he replied "good, very-good," that counted two. If he replied "good, very-good," nodded his head yes and smiled, it counted four. Incorrect responses, a negative response when it should have been positive, were not recorded. All observations were made from the video tapes so that students were unaware that this research was being conducted.

In order to test the relationship between student scores on the verbal recall test and ability to apply positive reinforcers in the Controlled Teaching Laboratory, students were ranked from highest to lowest on both tests. A Spearman Rank Order Correlation Coefficient was used to measure the degree of relationship.

Results:

Controlled Teaching Laboratory Performance scores, i.e., the number of positive reinforcers used, and scores on the verbal recall end-of-unit examination are listed in Table 1 for twenty-four students. Originally a 10% random sample was chosen from the 260 students participating in the training session. Of the original 26 students selected, two failed to complete both test situations.

Column 1 shows the distribution for "number of positive reinforcers used." The frequency of positive reinforcers used ranged from 27 to 0 with a median of 8. The mean rate of positive reinforcers used (based on a five minute teaching unit) was 1.4 per minute. The distribution contained four tied ranks. The second column lists the percentage of correct answers scored on the end-of-unit examination. The scores ranged from 98% correct to 66% correct with a median score of 89%. The distribution included four tied ranks.

The Spearman Rank Order Correlation Coefficient, used to measure the relationship between the two situations, is .06. This low correlation coefficient indicates very little relationship between the students' performance in the Controlled Teaching Laboratory and the unit test, thus, the hypothesis that there is no relationship between the two situations is supported.

On analyzing the data from another perspective using Figures 1 and 2, which show the frequency of students obtaining specific scores in the Controlled Teaching Laboratory and on the verbal end-of-unit examinations respectively, some interesting characteristics of the distrubutions become apparent. First, the distribution in Figure 1, which shows scores for the Controlled Teaching Laboratory, is skewed to the left indicating that a large proportion of students in the sample did poorly in the applied situation; whereas, the distribution in Figure 2, which shows scores on the verbal end-of-unit examination, is skewed to the right indicating that a large proportion of the students performed well in the verbal recall test situation. Second, while the performances in general were poor in the teaching situation, i.e., one third of the students in this sample used less than one positive reinforcer per minute, the test scores on the verbal unit examination were very good with only one student in the sample scoring below 70% correct which is the usual cut-off point for satisfactory performance.

Discussion:

What are the implications of the data presented above? First, the evidence supports conclusions drawn from casual observations that, at least in this instance, course work is non-relevant to the task of teaching. Comparison of the oppositely skewed curves in Tables 1 and 2 even indicates an inverse relationship between the two. However, there is no additional evidence to support this hypothesis; and, when the almost zero correlation coefficient of .06 is considered, it seems a reasonable hypothesis that the student learns nothing in the verbal material which is directly applicable to the task of teaching. Stated another way, learning to recite as a student does not appear related to learning to teach as a teacher. One possible explanation for the variances in controlled teaching performance lies in the variances of individual personalities rather than in skills gained from the course of instruction. Until further research provides evidence to the contrary, it does not seem unreasonable to speculate that the only teaching skills presented to the students during the course were presented to the students during the course were presented via the example of the instructor's teaching performance when instructing the class.

Second, the data presented in Tables 1 and 2 shows how misleading and *invalid* tests can be when used to measure the effectiveness of a course of instruction. The verbal recall test data in Figure 2 shows only one student scoring less than 70% correct (failing) and almost half the students, 11 scoring at 90% or above correct. Based on this information we would judge the course of instruction adequate. However, when one considers that the course objective is to train students to apply the principles learned rather than just recall them, and evaluates the course of instruction using the Controlled Teaching Laboratory performance data presented in Figure 1, the conclusion is the opposite that the curriculum and/or instructual procedures are inadequate and need extensive revision.

Fundamental to the value of this study is the accuracy of the assumption that performance in the Controlled Teaching Laboratory is directly related to actual teaching performance in the classroom. The rationale underlying this assumption comes from research done in the area of "Transfer of Learning." The general principle being that the greater the similarity between situation 1 and situation 2 the greater the transfer of ability. However, this is only a beginning point and consistent with my earlier position, I would like to emphasize the need for research which will establish both the nature and degree of the relationship between teaching in the Controlled Teaching Laboratory and teaching in the classroom. One major deterrent to this type of research is the lack of observational procedures for measuring teacher performance. Perhaps, a form of the Controlled Teaching Laboratory could be useful in developing these procedures Perhaps, by using the more precise controls available in the Controlled Teaching Laboratory we may be able to discover, and define behaviorally, what effective teaching is.

This study is exploratory in design. Two separate, but related, problem areas were explored as beginning steps toward solution of the general problem of providing more meaningful teacher training programs. The first step was pinpointing as a major source of difficulty the use of expedient verbal recall tests to measure the effectiveness of instructional material in lieu of empirical data feedback. The specific difficulty being that verbal tests are often invalid in terms of course objectives. The second step, based upon research conducted in the area of transfer of learning, was the use of the Controlled Teaching Laboratory as an alternative teaching procedure for both grading students and evaluating course curriculum and/or instructional procedures. I believe the results of this study have demonstrated the feasibility of using the Controlled Teaching Laboratory. And that further research is now needed to establish procedures for: a) applying the Controlled Teaching Laboratory approach to other types of teacher training courses; b) for observing, and accurately recording, effective teaching behaviors used by practicing teachers in the classroom; and then to c) empirically establish the validity of the Controlled Teaching Laboratory in predicting teacher classroom performance of students.

Table 1

CONTROLLED TEACHING LABORATORY PERFORMANCE AND "LEARNING" UNIT TEST SCORES FOR EACH SUBJECT

Subject	Number of Positive Reinforcers Used	Percent Correct Answers on Unit Test	Subject	Number of Positive Reinforcers Used	Percent Correct Answers on Unit Test
1	27	92	13	8	96
2	21	88	14	7	94
3	20	77	15	6	90
4	18	96	16	5	91
5	16	86	17	4	82
6	16	86	18	4	89
7	15	78	19	2	96
8	14	98	20	1	92
9	11	95	21	1	92
10	10	82	22	1	80
11	9	85	23	1	79
12	8	66	24	0	72

FIGURE 1

Distribution of Subject According to Number of Positive Reinforcers Used in the Controlled Teaching Laboratory

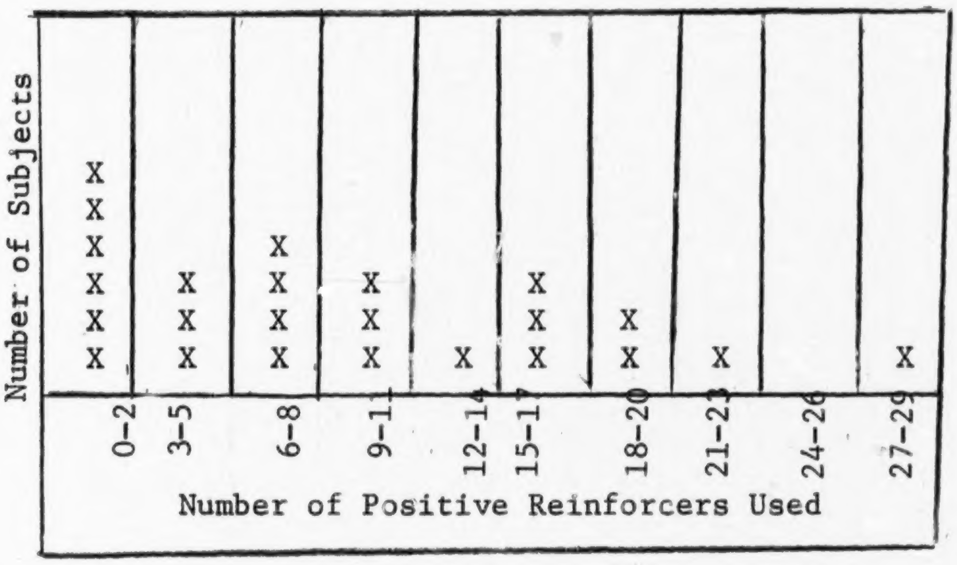
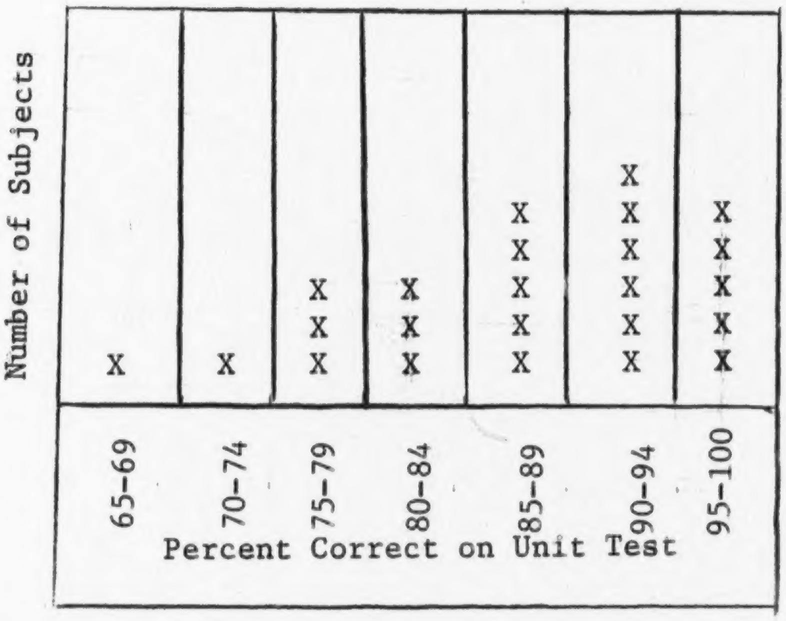


FIGURE 2

Distribution of Subjects According to Scores on Learning Unit Test



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Footnotes

[1] The "Phi Delta Kappa," professional education fraternity, devoted their annual research symposium (April 1969) to exploration of this general problem. (Phi Delta Kappa, 8th & Union Streets, Bloomington, Indiana 47401.) An example of this is found in a current Educational Psychology text which devotes an entire chapter to the development of verbal tests. (Allen J. Edwards, Dale P. Scannell, Educational Psychology, International Textbook Company, Scranton, Pa., 1968. p. 554.

[2] In their text Edwards and Scannell introduce the chapter on test development stressing the need for tests relevant in terms of instructional objectives. They then proceed to discuss this topic in terms of measuring course content. (Allen J. Edwards, Dale P. Scannell, Educational Psychology, International Textbook Company, Scranton, Pa., 1968. p. 555-563.

[3] For a further discussion of the design and uses of this Controlled Teaching Laboratory see:

[4] Some demonstrated applications of "social reinforcers" are: Florence R. Harris, Montrose M. Wolf, and Donald M. Baer, "Effects of Adult Social Reinforcement on Child Behavior," in Ed. Sidney W. Bijou, Donald M. Baer, Child Development: readings in experimental analysis, Meredith Publishing Company, N.Y., 1967. p. 146. And Frederick H. Kanfer, Vicarious Human Reinforcements: A Glimpse into the Black Box," in Ed. Leonard Krasner, Leonard P. Ullmann, Research in Behavior Modification, Holt, Rinehart, and Winston, Inc., N.Y. 1965. p. 244.

APPENDIX I

INSTRUCTIONAL OBJECTIVES: A PRECISE FOCUS FOR SUPERVISORS

Harry V. Scott

The supervisor is in no position to dominate instruction, even if he should choose to do so. Yet, he must be concerned with what is being taught to children as well as how it is being taught. The assumption that teachers automatically have the "expertise" to know what should be taught is a silly notion that has been shown to be untrue by the recent curriculum turmoil in mathematics, science, and the social sciences. At the very least, one person besides the teacher should share the responsibility for the content being used in a classroom. The supervisor would seem to be the likely person in most school organizations, since he is considered by most superintendents to be responsible for the improvement of instruction.

That may be a sharp way of saying what most supervisors believe. The point remains, however, that a supervisor can influence instruction without reverting to fuss-budget tactics. One meaningful and productive way is by working with teachers on the objectives for the academic fields which they will teach.

How a teacher accomplishes these objectives is less of a concern. The "how" is basically synonymous with the term "expertise", which jargon-users talk about so grandly. Also, the "how" can be readily improved when the objectives for a study are clearly spelled out. In general, it is most helpful to know exactly what you are trying to achieve, and knowing this "what" simplifies the "how" This is the great power of an operational definition, and an adequately stated objective is a form of operational definition.

How does one proceed? David Krathwohl (1965) has described the three levels at which objectives may be stated: program, curriculum, and instructional objectives. It is the latter two that must be the concern of the principals in working with teachers.

Let's try an example. At the program level an objective might be stated as developing the ability to read with meaning. Such an objective is, analytically speaking, a slogan: it implies nothing. No one would quarrel with it. Too often supervisors and teachers conclude that having an objective they are done with objectives (Ammons, 1962). But that is not the case!

Suppose we were then to ask,"What does it mean to read with meaning? What is a person able to do who can read with meaning?" If you can establish what those abilities are, then you will have some curriculum objectives at which to shoot. One of these abilities might be the ability to read a newspaper with discretion and comprehension. You can readily see that curriculum level objectives narrow the field a little bit. They are not suitably stated for instructional purpose, but they do suggest one of the areas in which competency must be built if a student is to read with meaning. Another ability that might add to this program objective of reading with meaning is "the ability to predict or estimate consequences of courses of action described in a communication (Bloom, 1956, p 96)."

By all means a supervisor and a teacher should work together in formulating objectives such as these at the curriculum level. But these are not adequate objectives for instructional purposes; they are still too general. Unfortunately, supervisors have often stopped at this level, and have, therefore, had less effect on the program in their schools than they had hoped to have.

The next step is to work with a teacher in spelling out objectives at the instructional level. Let us take an example that follows from those above. What does it mean when we talk about the ability to read a newspaper with discretion and comprehension? The first thing that we might say is that it is not really an ability at all; it is a group of abilities. One of these lesser abilities might be described this way: When given an editorial from any American newspaper (written in English), students will classify the statements in that editorial according to these concepts: clearly factual statements, probably factual, hypothetical, probably opinionistic, clearly opinionistic. Or another instructional objective might be this: When given a news story from any American newspaper (written in English), students will identify and list technical terms used, slang terms, slogans, ironic terms, and straight information.

Communications specialists might quarrel with some of the concepts suggested in the two instructional objectives; but the point remains valid. The ability to read a newspaper with discretion and comprehension does require the two abilities stated above, and it requires several more as well. Depending upon the teacher's and supervisor's assessment of a given class, these two people would spell out the objectives that seemed reasonable and necessary for the students on the topic under consideration. It remains a matter of independent professional judgment as to which objectives and how many are needed.

In summary, supervisors have a stake in the day-to-day instructional programs of their teachers. Supervisors, as highly educated persons and as curriculum leaders in their buildings, wish to influence instruction but not dominate it. To the extent that teachers can write clearly stated objectives at the instructional level, the supervisor's task is to help the teacher decide which objectives are reasonable and essential. When a teacher cannot write objectives at the instructional level, and at this point in history few can, the supervisor's task is to help a teacher learn that skill. This can be done while working on the content she will teach.

Now, let us take one more look at objectives--a slightly different look. Let's consider the necessity for getting objectives that require the use of a variety of intellectual abilities by students. Some years ago the Taxonomy of Educational Objectives: Cognitive Domain appeared. At first it was used primarily as a tool for analyzing text questions and, of course, as a guide for constructing test questions. In recent years it has come to be used more commonly for analyzing and constructing materials. Let us see how this is done and what meaning it has for supervisors.

The taxonomy provides a scale or progression for educational objectives from simple to complex. Objectives which require only that students recall knowledge are the simplest objectives; that is, recall objectives are the least demanding from an intellectual viewpoint. Comprehension objectives require recall of knowledge, but they also require that the knowledge be put to some use. Application objectives require recall, and comprehension and something more. Analysis is the next most sophisticated cognitive behavior, then synthesis, and finally evaluation. In general, a student has not made a procedure or piece of knowledge his own until he has used it at the application or analysis level.

In planning with a teacher, a supervisor would want to help plan objectives at all of these cognitive levels, or at least at more levels than recall of knowledge and simple comprehension. The taxonomy is a useful guide for doing this, as it includes examples of objectives at the various levels. With practice a principal, and his teachers would improve in the ability of stating objectives at various levels.

Finally, here are a few practical suggestions for getting information on these skills. The taxonomy is inexpensive and readily available. It is the best source for an examination of curriculum-level objectives. It can also be used as a guide in building instructional objectives at a variety of cognitive levels.

As for writing objectives at the instructional level, a good primer is Robert Mager's book. Preparing Instructional Objectives (Palo Alto, Calif.: Fearon Publishers. 1962). Another very useful book is Defining Educational Objectives, edited by C.M. Lindvall (University of Pittsburgh Press. 1964). These provide a solid and relatively simple start. A third source would be any of the widely used textbooks on programed instruction, all of which give attention to stating objectives at precise instructional levels. These should be useful in the beginning stages of building the skill of writing objectives. However, it is not a skill learned in one day.

Teachers expect supervisors to be "one of us," but they also expect supervisors to assume leadership. The exercise of judicious leadership requires that a leader have the skills which his colleaques need. This paper suggests one operational method, a conceptualization if you will, for supervisors in their role of instructional leader. It is a method that is ideal for working with individual teachers, but can be very effective with groups. It is a method that the whole faculty can discuss and use in common, even though each may make quite different applications of it in content. And, of course, it envisions the supervisor working at the immediate instructional level without the undesirable connotations that this level of supervision once had.

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APPENDIX J

A COOPERATIVE VENTURE IN THE IMPROVEMENT OF TEACHER EDUCATION

I. "Cooperation" Defined.

In addressing myself to the topic which has been given me, "A Cooperative Venture in the Improvement of Teacher Education", I will describe some of the work done in a project funded under Title III of the Higher Education Act, COOPERATIVE PROJECTS FOR STRENGTHENING OF DEVELOPING INSTITUTIONS. This inter-institutional cooperative "adventure" is the only one of our college's cooperative projects that I will discuss today. We also have, as you probably do, cooperative ventures with public school systems, with poverty groups, and with other agencies, but I will not speak of those today, and I hope you are not disappointed. I see this as a case example for us and wonder how other cases could be made known to us. Maybe NCA has a job here.

In this cooperative adventure in the improvement of teacher education I want to emphasize only two of the words, "cooperative" and "improvement". I would like to start by clarifying some meanings of the word "cooperation". I will talk of an attempt to build organic cooperation among institutions. I want to oppose that to some of the other Title III Projects of which I have knowledge that do not operate in an organic manner, but seem to operate on something such as "plantation psychology". This is the case when the developed or cooperating institution makes its resources available to poor little brother, the developing institution. I would also oppose organic cooperation to another notion commonly placed under the rubric of cooperation which I call "proximity".

Proximity is a phase that we had to go through before we could move toward organic cooperation. Just being together, being accessible by letter, or phone, or in meeting--though these represent an improvement over isolation, I have no doubt--do not constitute organic cooperation.

As for "plantation psychology", that is partly a function of the attitude of the developed institution and partly a function of the project design. With the best will in the world, a poorly designed Title III Project will have difficulty getting away from plantation psychology. Our cooperating institution is West Virginia University. West Virginia University has profited immensely from this project. They are working out their own scope and sequence in teacher education, or reworking it, while having us join in on this adventure, realizing that the three state colleges in the project will benefit in different amounts and in different areas. The main point is that the University is not being good to us poor little children. They are in fact getting more out of it than anyone else, and it behooves us as developing institutions to take as much as we can from the project since the University has gladly made use of our talents.

Vehicles for Cooperation.

I would like to describe some of the vehicles we developed for cooperation on the route to "organicity". This project is nearly two years old at this time. It began in the summer of '67 with a writing session held on the University campus. Each institution sent four faculty members to cooperate in the development and writing of instructional materials and packages. Partly by design but more because of the nature of the project, we found ourselves working in groups in areas of interest with individuals from the other three institutions. The initial work of designing the objectives, evaluation instruments and the instructional packages was begun at this time.

One of the notions clearly reflected on the syllabi and in everyday interaction is the influence of the principles of programmed instruction. We find as we examine the films and filmstrips and other media which we are building into our teacher education sequence that instructors now routinely build in procedures for active student involvement and corrective feedback. This careful attention to involvement and feedback have represented the important contributions of programmed instruction to general instructional improvement. These changes are obvious and clear in project members, and as far as I am concerned, in the right direction.

In addition to the tests and syllabi we have developed sets of competencies for the whole professional education sequences. We have been sharing these with non-project institutions, influencing their programs. It is obvious that our scope and our sense of sequence have changed, have become better integrated. I would go further and say that, in my opinion as a curriculum theorist, our scope and sequence have improved if for no other reason than that we now conceptualize them more functionally. Some of these data are not very good, are they, but at least they are measures of change and possible improvement.

Most of us want to move in certain directions in teacher education these days. The question is how you gear up for it. How can you establish a functional focus for change. For us this project has been the organizing point. It has had, among other influences, some financial reinforcers in the way of summer salaries, trips, and purchases of materials. These reinforcers are important to keep the momentum of change, and it is through the project that we have been able to build in these reinforcers. It has also represented the source of funds for hiring and developing new faculty members to implement project activities.

There were some hard feelings in these summer sessions, and a few unproductive groups, mainly because some of the faculty members engaged had interests and personalities that didn't lend to the emphasis or the mystique of the project. A few poorly selected people can cause a hell of a lot of trouble in a cooperative group writing session.

When we returned to our institutions in the fall, we assigned one representative from each college to the University campus as a full-time project member. These full-time members represented the focus for the whole project, and they were situated in the right place. It was they to whom we assigned functions; it was they to whom the University assigned the developmental work begun in the summer time. They have continued to be the focus development, and a rather large portion of the products developed in this project can be attributed to the work of the full-time members. As for the summer working groups, we had some hopes that they would continue to function in some manner or other during the academic year. Now after two summers of this sort of thing, we have come to the conclusion that there is a disappearing tendency involved in summer work groups, and that unless considerable resources are pumped into these groups, they will not function effectively or organically during the academic years. On the other hand the individual colleges made considerable contributions to the total project by the work done by project teams back home. This again was a function of the pre-planning done for the college year by the college team.

Perhaps the only decent means of communication that we had during the academic year were several meetings of the project teams. These were in part for sharing experiences, but in a large part for the bringing of new ideas and new materials and equipment to the attention of the project as a whole I developed the procedure of sending memoranda to the various colleges, mentioning the kinds of things my people were doing and making suggestions for and evaluations of the kinds of materials that we had bought or previewed. I found during the second summer that this work was very much appreciated. But I would put these memos and meetings under the proximity sense of cooperation rather than in the organic sense. One suggestion: In any such project you need at least one compulsive writer--preferably a memo writer. Deans are compulsive memo writers.

We were rather displeased with the early lack of organic cooperation. During the second summer when we again conducted four-member writing sessions at the University, we made some changes. First, each of the colleges made sure that it sent people who had the ability to get something done, and who at the same time had enough power back home to make sure that the changes were more than just paper changes. This extra commitment on the part of the colleges, I believe, was the critical element in making the second year of the project so much more successful than the first year.

Secondly, the project coordinators from the four institutions developed a document in which we pledged ourselves to some organic means of cooperation. This commitment included such things as requiring each of us to develop during the academic year no fewer than four complete modules of instruction. These could be videotapes, slide-tape presentations, illustrated taped lectures or whatever. Each of us was to develop four modules and circulate them to the other institutions--no fewer than four of these. That helped in setting our targets. Clearly we have exceeded this minimum. We also committed ourselves to using in our instructional programs at least one of the modules from each of the other institutions.

There were other commitments such as sending a memorandum and materials, describing activities of the project team, etc. It will not surprise you that several of the team members had a hard time convincing themselves that they wanted to sign their names to any sort of a formal commitment paper that affected instruction. I believe that that was a key move in making cooperation organic, in getting away from the talk level. There were the summer writing groups, the full-time project people, written commitments--now it is time to move to the materials themselves.

Materials--Cooperation in Concrete Form.

Obviously materials represent the most concrete form of cooperation. The cooperation becomes real when commitment is made on the part of each institution to preview and use materials developed at other institutions. Each of us has agreed for example to field test one of the big projects developed on the University campus. My college, for example, has met this commitment in several ways. One way was by bringing our full-time member down once a week to teach a course in "Tests and Measurements", the various segments of which had been developed or acquired through the project. A considerable section of this course is self-instruct. It is our plan to have the requisite competencies in this area of evaluation wholly on a self-instruct basis before the project ends.

I have mentioned that we developed other packages of instructional objectives, instructional materials, evaluation instruments, and the media backup, the paperwork backup, etc. These packages of instruction are another common focus, another source of organic cooperation. In developing instructional units we have not attempted to identify the curriculum sequence nor make a determination as to where and how the units or material will be used in anyone's program. This aspect of development has permitted the recognition of institutional autonomy in the development of its own program. Some schools have used the packages on objectives and learning in the pre-student teaching phase, others have found them more useful in student teaching. One more, and this will be no surprise to you, our videotape recording systems have been the simplest and most successful of the cooperative efforts. We developed the specs together and ordered all of the systems in one package. We find ourselves willing to share videotape recordings and procedures and techniques perhaps more readily than we share anything else. Possibly the newness of these elaborate toys reduces hesitancy in sharing. I think that sharing videotapes and audiotapes, and joint production of both of these, represents perhaps the best entry points that institutions can take to build organic cooperation.

Cooperation in the Future.

Along this same line we have found other ways to cooperate in purchasing. We've begun to share our major purchases and services. We are planning to buy big package deals that are now coming from publishing houses and electronic houses with the thought that we will share them among the institutions. We have started this in a small way and find it very successful. There are more and more of these package deals and educational services coming out all the time, so the notion of sharing becomes an important idea. Most of these large items and services you simply do not need to have all the time. I anticipate that this shared buying practice among institutions will grow in our state. I am hopeful of bringing other institutions in for collaborative purchasing.

Let me mention one other area in which I see a future for organic cooperation. We will be meeting as a whole project group later this week at the University. We will take our first steps toward building a cooperative project using the telelecture system, the wire-blackboard device. These obviously are naturals because universities have equipment and resources that we simply do not have. We will begin very simply by exploring the dimensions of these systems. It will take us some time to develop objectives which we can achieve using these means and even longer to get some experimental production underway. I anticipate that, should we be refunded for the third year, this will represent our major area of new development as cooperators. Each institution has directions that it will take on its own, but we will share developments with each other. The key point is that we plan to keep organic relations rather than slipping back to proximity relations.

I hope what I have said so far does not indicate that West Virginians are unusual in this matter of cooperation. I think cooperation among institutions at an organic level is not the norm, even though there is a need to develop it much as institutions are now developing student teaching centers as organic ventures with public school systems or as they are developing teacher aide training programs cooperatively with public schools and poverty agenices. So must we learn to cooperate among ourselves where the relationship is a peer relationship.

"Improvement" in Teacher Education?

Now I'm going to switch from the concept of "cooperation" to "improvement". We have attempted where we could to run studies and to gather other forms of descriptive information. I will try to highlight these more rigorous attempts as I go along, but I will also mention under this rubric of improvements some changes which, prescriptively speaking, I consider to be improvements.

First, I would like to mention some of the more nearly quantitative things that have been done. We are interested in student reactions to self-instructional materials, laboratory settings, etc. The bulk of the attitude survey work is being done by the University, but each college is doing something by way of attitude survey. We are quite interested, not only in initial attitudes of students coming into lab settings and programmed instructional settings, but in any changes over time. This will be a continuing area for sampling student opinion. In general our early data show that students overwhelmingly approve of these notions: (1) having criterion levels at which they can aim ("I can shoot for either an A or a C whenever I wish."); (2) being allowed to progress at a pace which they select (an inherent notion in programmed instruction); (3) being allowed to repeat a block of work in the reach for a higher level of competence and a higher grade. Students do miss having a teacher in the lab setting, perhaps a short-term effect.

The bulk of the research on academic achievement has been done by the educational psychology and measurement people at the University, naturally. As with the attitude surveys, achievement data, though not yet plentiful, are very promising indeed. For example, we have discovered that given the self-pacing mechanisms and necessary remediation students can reach our criterion levels irrespective of ability. (Obviously there are some motivation variables involved.) We are also finding that a laboratory plus programming combination can get better achievement than lecture over a range of competencies. But, we find that teacher plus programming is better than either one taken separately in getting achievement. We also have found that the structure of the non-laboratory sessions doesn't make any real difference in course achievement (lecture vs sensitivity groups vs independent study). Some very promising and intriguing leads!

Another evaluation instrument that will interest us is the National Teacher Examination. Since it is required of all teacher education graduates in West Virginia, it represents a common basis for standard evaluation. In two years we will have the first full group at the various colleges who have been subjected to a large extent to project materials and emphases taking NTE. We look forward with appreciable interest to see whether the scores on the professional portions of the exam rise. It will be quite easy to measure improvement, if any, at significant levels on the NTE, though no single causation would be inferred. If we do not get significant increases I do not think we can necessarily damn the project, but will have cause for being rather unhappy.

Syllabi as Measures of Change.

In addition to these measures I must mention course syllabi. We collected syllabi from each course at each institution before the start of the project. Already it is interesting to compare the old syllabi with those produced this year. My department has had always the tradition of writing a moderately detailed syllabi. Personally I have always written small "books" for my students as syllabi. It is interesting to note that even those who have always done careful work on syllabi have changed them so dramatically. And for those who never gave the work of syllabus-writing very much attention, the results are even more striking.

For example, attention to objectives stated in behavioral terms is remarkable. Before the project began only a few of the project members had any competence in writing objectives. Attention to evaluation procedures and to sequence and scope have shown equally dramatic changes. In so far as a syllabus represents attention to planning, there isn't any question that instructors who have been in the probject have given much more attention to their course planning.

I would like to conclude by mentioning the brightest prospect for long range improvement in teacher preparation at my institution. The project represented for us a species of reverse learning-by-doing. We wonder, as you do, how we can prepare teachers for the future who will use programmed instruction, technology, team teaching, behavioral objectives, and the like. Obviously we give direct instruction in student teaching. But there has always been a dimension missing in teacher education, it seems to me, and we are getting at it in this reverse "learning by doing." What it comes to, essentially, is practicing what we preach. We have programmed blocks of instruction for each of our courses. We have built media functionally into each course. We are now redesigning our freshman course for team teaching, instructional television, and other media. We no longer just show films, we program them into sequence. It is the plan to build for our students certain kinds of expectations because of our way of operating. We are practicing what we preach. We are not just telling them to use programming, feedback techniques, and team teaching. We are using these so that they will become accustomed to considering such approaches a simple part of an educator's working procedure--theirs as well as ours. This inter-institutional cooperative venture has been the organizing center for these changes. Thank you

APPENDIX K

The Relationship of Aptitude to Other Variables in Mastery Learning

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Rogers McAvoy, Ph. D.
and
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West Virginia University

Objectives of the inquiry: One of the generalizations that is beginning to emerge from research pertaining to instruction is that aptitude has certain predictive qualities. During the past year the writers in working with an instructional program that utilized an individual presentation mode have become interested in testing the functional relationship between the independent variable aptitiude and other dependent variables in an instructional design. The study reported herein was designed to explore these relationships in a university setting and to suggest hypotheses for further study.

Scope and methods: A check-out station at the University Learning Center offered a unique opportunity to acquire accurate measures of variables under rigidly controlled conditions. For the purpose of this study, selected mastery variables were measured in the following way:

(1) Aptitude: as measured by the American College Testing Aptitude Battery (ACT);

(2) Achievement: as measured by paper and pencil pretests and post-tests designed around program objectives;

(3) Gain: as measured by post-test score minus pretest scores; and

(4) Time: minutes in instruction as recorded with time clocks.

Subjects were exposed to an instructional mode utilizing an individual presentation mode with both written and mediated content that could be viewed as often as necessary. The optional level of performance was set at 90 per cent on equivalent from criterion tests. Subjects not reaching this performance level were referred to remedial content for additional work and then given opportunities to achieve criterion level on equivalent forms of the tests.

Data Source: Data were collected from 120 sophomore subjects enrolled in an introductory Educational Psychology course at West Virginia University. When the subjects ACT scores were plotted they assumed a normal distribution.

Results and conclusions: The data was submitted to zero-order correlation, one way analysis of variance, and step regression. In addition, an analysis of covariance was used to adjust for a pre-test effect by using pre-score as a covariate. The adjusted means were submitted to a one-way analysis of variance and analyzed with an F-test. Major results were as follows:

(1) High aptitiude subjects score higher on pre-tests and repeat fewer post-tests than low aptitude subjects;

(2) Aptitude did not correlate with post-test scores, time spent in the program, or rate;

(3) Aptitude correlated negatively with gain; and

(4) Given high and low ACT scores with an adjustment for pre-test effects there were no significant differences between ACT and gain, rate, and time.

On the basis of these findings the following conclusions were drawn:

(1) Within the limitations of this research aptitude did not have the predictive qualities suggested by the literature. Aptitude was not positively related to rate, gain, time, or post-test score beyond the .05 level;

(2) High aptitude subjects score higher on pre-tests and took a fewer number of post-tests; and

(3) Aptitude has a significant negative correlation with gain.

Educational importance: These data indicate that within the limitations of this study aptitude does not have the predictive qualities generalized in the literature. This minority position is in need of greater replication with more rigorous control of mastery variables in similar mastery designs before these conclusions may be generalized to a larger population.

APPENDIX L

An Analysis of Learning Variables in an Individualized Model of Instruction

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Objectives of the inquiry. This study is based on the assumption that a major determinent of learning ability is the amount of relevant learning capacity a person brings to a new learning task. Thus aptitude, defined as a person's capacity to learn, should tend to predict learning. In other words, as aptitude increases the capacity to learn as measured by learning gain scores should increase. The purpose of this study is to critically examine the relationship of the independent variable aptitude on the dependent variable achievement as measured by gain scores.

Scope and methods. An adequately staffed check-out counter located in the college of Human Resources and Education's Learning Center offered a unique opportunity to acquire an accurate measure of the dependent variables under rigorously controlled conditions. For the purpose of this study the selected variables were measured in the following ways:

(1) Aptitude: as measured by the American College Testing Battery (ACT);

(2) Time: amount of minutes students spent in instruction as recorded on time clocks;

(3) Gain: as measured by a program produced paper and pencil post-test minus a program produced paper and pencil pre-test; and

(4) Modified gain: as predicted by the post-test minus the pre-test divided by the total number of points on the test minus the pre-test socres.

Subjects were exposed to an instructional model that utilized an individual presentation mode with both written and mediated content that could be viewed by students as often as necessary. Short-answer response criteria tests were used to determine student attainment of specific objectives. An optimal level of learning was represented by a performance of 90 per cent or higher. If this level of performance was not reached a students was referred to additional content for remedial work and then given opportunities to achieve criterion level on equivalent forms of the test.

Hypotheses were generated predicting that the higher the aptitude the higher the achievement scores as measured by gain.

Data source: Data were collected from 120 sophomore subjects enrolled in an introductory educational psychology course at West Virginia University. When the subjects' ACT scores were plotted they assumed a normal distribution.

Results and conclusions: Correlational analysis revealed the following results:

(1) A significant negative correlation between aptitude and gain;

(2) A significant positive correlation with time and gain:

(3) A significant negative correlation between aptitude and gain when time is partialed out;

(4) A significant positive correlation between gain and time when aptitude is partialed out.

An analysis of variance of the upper 25% and lower 25% of the distribution of ACT scores led to the following results:

(1) low aptitude subjects are making significantly greater gains than high aptitude subjects with no significant difference in time spent in the program;

(2) even when the ceiling effect is taken into consideration in a ratio of actual gain divided by possible gain, there is no significant relationship between aptitude and gain.

On the basis of these findings the following conclusions were drawn:

(1) In an instructional design that utilizes behavioral objectives, small sequential learning steps, paced mediated content, and criterion levels on testing instruments the data indicated that time is more important in predicting gain than aptitude.

(2) Even when the ceiling effect is taken into consideration in a ratio of actual gain divided by possible gain, there is no significant relationship between aptitude and gain.

Educational importance: These data indicate that within the limitations of this study time is more predictive of gain than aptitude. As subjects spend more time in this program their gain scores increase. These results are in conflict with the position in the literature that religates time as less important than aptitude in predicting gain.

APPENDIX M

An Analysis of Gain Scores with Unlimited and Limited Exposure to Content

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Objectives of the inquiry. The purpose of the present study was to investigate if unlimited or repeated exposure to content would have any affect on the dependent variable achievement as measured by post-test scores minus pre-test scores.

Scope and methods. For the purpose of this study the selected variables were measured in the following ways:

(1) Time: amount of minutes students spend in instruction as recorded on time clocks; and

(2) Gain: measured by pencil and paper post-test scores minus pencil and paper pre-test scores (tests were designed around program objectives).

One hundred and seventeen subjects enrolled in an introductory educational psychology course in 1969-70 were exposed to an instructional approach that consisted of a series of one exposure fifty minute content presentations that culminated in a summative evaluation. A second population consisting of 236 subjects were exposed to an instructional model that utilized a mediated presentation mode that could be viewed by students as often as necessary and was accompanied by formative evaluation feedback leading to a summative evaluation. The independent variable was mode of presentation (one exposure to content versus unlimited exposure to content). Gain scores measured by post-test minus pre-test were the dependent variable.

Data Source: Both populations of subjects consisted of all the students enrolled in this introductory education course at West Virginia University during their prospective semesters that took both a pre-test and a post-test for each instructional unit. A large majority of these subjects were sophomores with small numbers coming from both junior and senior classes. The class composition was the same in each group.

Results and/or conclusions: An analysis of variance revealed the following results:

(1) Significant differences were found at the 05 level of significance in favor of repeated exposure to content in three of the four instructional units before covarying for pre-test score;

An analysis of covariance was used to adjust for the pre-score affect by using pre-test score as a covariate. The adjusted means were submitted to a one-way analysis of variance and analyzed with a F-test. Major results were as follows:

(1) After covariance for pre-test score repeated exposure to content resulted in significantly greater mean gain scores at the 05 level in each instructional unit.

On the basis of these findings the following conclusions were drawn:

(1) Greater mean gain scores were achieved when unlimited amounts of time were given for exposure to content;

(2) Results support the assumption that different amounts of exposure time are required by learners to attain mastery of a subject; and

(3) Repeated exposure to content is necessary if students are to achieve maximum performance on paper and pencil tests.

Educational Importance: Even though these conclusions may not be generalized beyond the confines of the population studied, one theoretical implication is of educational importance. Mastery learning is supported by the results of this study. When an instructional model was implemented that gave subjects greater opportunity to be in contact with content the mean gain of subjects increased.

APPENDIX N

FAIRMONT COLLEGE: A COMPARISON OF INSTRUCTIONAL METHODS

Submitted

September 1971

In 1967 the Federal Government funded a cooperative Title III Project that involved the development of undergraduate teacher education programs and the development of materials to be used in these programs.

In 1968 a field test was conducted on the Fairmont campus with an "Educational Measurement" unit cooperatively developed in the federal program during the previous summer in a Developing Institution Workshop at West Virginia University.

The unit consisted of the following:

1. handouts of behavioral objectives for the unit;
2. equivalent form pre-tests and post-tests;
3. slides, audio-tape lectures; and
4. student activity sheets.

The purpose of the field test was to answer this question: Are project produced programs and activity sheets more effective in helping students in a group mode self-instructional approach to achieve mastery than the lecture mode of instruction presently used at Fairmont?

Procedure. Group A which consisted of sixty-nine senior educational psychology students who were randomly assigned as an experimental group. Group B which consisted of thirty-two senior educational psychology students was randomly assigned to a control group.

Group A, the experimental group, was exposed to project produced materials and slide tape programs.

Group B, the control group, was exposed to a lecture mode of instruction.

Group C consisted of group B students who were exposed to the slide-tape programs two days after this initial exposure to the lectures.

Method

1. "Pre-test" in classes on Thursday and Friday, March 28 and 29. Handouts of "Behavioral Objectives of Measurement Unit" and "Educational Measurement Unit 1" in classes on Thursday and Friday, March 28 and 29.

2. At 8:00 and 9:00 on Monday, April 1 and at 3:00 on Tuesday, April 2 the slides and audio tape lecture covering this material will be presented in classes in room 318A. The students were presented a "Measurement Lab Involvement Sheet".

3. Slides and audio tape lecture were played a second time on Wednesday, April 3 for students desiring to see them a second time.

4. The test covering the unit was administered on April 4 and 5.

5. A control group consisting of the 1:30 class on Tuesday and Thursday heard a lecture only (no visual slides or audio tape). They had the pre-test, the Behavioral Objectives and the "Educational Measurements" material given to them on March 28.

Results. The statistical technique used in this analysis is a t-test with an alpha level of .05. The hypotheses were:

Ho: $w_1 = w_2$

Ha: $w_1 \neq w_2$

The results of this analysis are as follows:

Group	Results	t-test	t-ratio	critical	point
Group A & B	reject null	t	2.04	1.98	.05
Group A & C	accept null	t	1.85	2.02	.05

These findings indicate that the use of project produced materials resulted in significantly fewer student errors than the lecture mode of presentation. When the project produced materials group was compared with the group that experienced both the lecture and the project produced materials (group C) no differences were detected.

Conclusion: The results of this study indicate that the project produced content is superior in helping students master a specific set of objectives. The slide-tape group was significantly better than the control group who experienced a lecture approach and equivalent to the group who experienced both the slide-tapes and heard the lecture (Group C). This study indicates that a group mode slide-tape approach is more efficient in terms of achievement in teaching over a specific set of objectives than a lecture approach and superior in time and equivalent in achievement in teaching over a specific set of objectives than a combination slide-tape lecture approach.

The results of this study are supportive of the instructional models that are being refined in the Developing Institution Project and of the method of implementation of project produced content at Fairmont State College. The results of the study, in addition to answering the purposed research question, suggest the feasibility of several additional refinements in the instructional model being developed at Fairmont State College. Other pilot studies are being designed to explore the consequences of these refinements.

APPENDIX O

ADDITIONAL PAPERS WRITTEN ON PROJECT-RELATED TOPICS

Published

David Koontz & Harry V. Scott, "Handbook for Supervising Teachers," West Virginia State College Bulletin vol. 56: no. 2, August 1969, 1-31.

Harry V. Scott, "Instructional Objectives: A Precise Focus for Supervisors," Journal of Education (Western Carolina University), vol. 1: no. 2, Fall 1969, 30-33.

______, "The Concept of Transfer in Education," Education, vol. 90: no. 4, April-May 1970, 299-301. (Bloom's Taxonomy)

______, "A Grading System for College Courses," Improving College and University Teaching, vol. 18, no. 4, Autumn, 1970, 303-304.

______, "A Cooperative Venture in Teacher Education," North Central News Bulletin, Spring, 1970.

Not Yet Published

Harry V. Scott, "The Taxonomy of Educational Objectives and the Curriculum Concept of Sequence."

______, "The Taxonomy of Educational Objectives and the Curriculum of Balance."

______, Paper commissioned by West Virginia Triple T Project; delivered at regional meeting in Spring 1971; to be published by Triple T (EPDA) in Summer 1971.

______, "Levels of Involvement: A Descriptive Theroy Model for Teacher Education."